GeoVision inc
The Vision of Security

GV-Smart Box

User's Manual

Before attempting to connect or operate this product,
please read these instructions carefully and save this manual for future use.

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Contents

Chapter 1 Introduction 1

1.1 Key Features 2
1.2 Packing List 2
1.3 System Requirements 2
1.4 Optimal Camera Installation 3
1.5 Recognition Limitations on Face Counter 4
1.6 Reference for Recording Capacity of a 1G Mini SD Card 5
1.7 Options 6
1.8 Overview 7
1.8.1 Front View 7
1.8.2 Rear View 8

Chapter 2 Getting Started 9

2.1 Installing on a Network 9
2.2 Assigning an IP Address 10
2.3 Configuring Basic Features 11

Chapter 3 Accessing the GV-Smart Box 12

3.1 Accessing Your Surveillance Images 12
3.2 Functions Featured on the Main Page 13
3.2.1 People Counting and Face Counter 14
3.2.2 Network Status 18

Chapter 4 Administrator Mode 19

4.1 Video and Motion 20
4.1.1 Video Settings 20
4.1.2 GV-Smart Box Settings 22
4.2 I/O Control 23
4.2.1 Input Setting 23
4.2.2 Output Setting 24
4.3 Events & Alerts 25
4.3.1 Compact DVR Setting 25
4.3.2 Web Report Setting 26
4.3.3 Database Inquiry 27
4.4 Network 31

4.4.1 LAN 31
4.4.2 UMTS 33
4.4.3 Advanced TCP/IP 35
4.4.4 IP Filter Setting 37
4.5 Management 38
4.5.1 Date & Time Setting 38
4.5.2 Storage Settings 40
4.5.3 User Account 42
4.5.4 Log Information 43
4.5.5 Tools 44

Chapter 5 Advanced Applications 45

5.1 Upgrading System Firmware 45
5.1.1 Upgrading Firmware over LAN 46
5.1.2 Upgrading Firmware by Using the Utility 46
5.2 Backing Up and Restoring Settings 49
5.3 Restoring to Factory Default Settings 51
5.4 Verifying Watermark 52
5.4.1 Running Watermark Proof 52
5.4.2 The Watermark Proof Window 53

Chapter 6 The I/O Terminal Block 54

6.1 I/O Port 54
6.2 RS-485/RS-232 Terminal Block 56

Chapter 7 Optional Device Connection 57

7.1 Connecting to GV-Web Report 58
7.2 Connecting to GV-NVR/DVR System 59
7.3 Connecting to GV-Compact DVR 62

Specifications 63

Appendix 64

Chapter 1 Introduction

The GV-Smart Box is a standalone device designed for indoor environments such as shops and offices. Connecting to any analog camera, the GV-Smart Box counts the total number of visitors entered or exited and recognizes the visitors' age and gender. Having this data not only helps you keep an eye on your properties, but also helps retailers identify peak traffic hours and customer demographics, providing valuable information for making strategic decisions.

Without installing any software, you can easily access the live images, counting data and face recognition results of the GV-Smart Box from anywhere in the world through a computer using the IE browser. You can also integrate the GV-Smart Box with GV applications such as GV-Web Report, GV-System and GV-Compact DVR to support extended functionality.

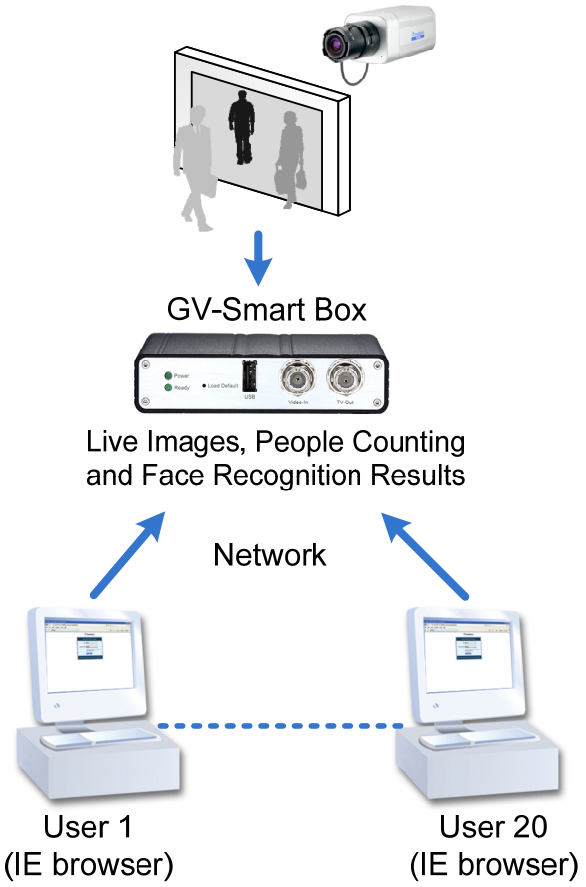


Figure 1-1

1.1 Key Features

- Counts the number of visitors
- Recognizes gender and age
- Easily accessible Web-based interface to watch live views, query database, and customize settings
- Triggers alarm when faces covered with masks are detected
- Supports digital watermark to verify the authenticity of data
- Supports UMTS
- Integrates with GV-Web Report, GV-System or GV-Compact DVR

1.2 Packing List

1. GV-Smart Box x 1
2. I/O Cable with RJ-45 Connector x 1
3. Power Adaptor x 1
4. GV-Smart Box Software DVD x 1
5. GV-Smart Box User's Manual on Software DVD

1.3 System Requirements

These are the requirements for the computer that displays the image or controls the GV-Smart Box.

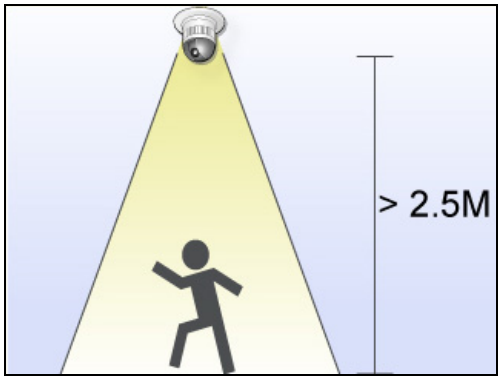
- **OS:** Microsoft Windows XP / Vista / 7 / Server 2008
- **Web Browser:** Internet Explorer 7 or later

1.4 Optimal Camera Installation

To get the optimal people counting and face or age recognition results, follow the instructions below to install the camera.

People Counting:

- The camera should be installed to the ceiling at least 2.5 meters above the floor. The camera should face straight down.



- Position the camera in the middle of the two defined detection zones so that the system can easily identify people when they pass through.

Positioning the camera in the middle of two defined detection zones.

- Don’t install the camera in such an angle that the view of people size varies dramatically.
- Make sure that no doors or any items are ever crossing the middle line where the camera is installed. If a door is opened towards the camera, place the camera further away from the door.
- Avoid placing the camera where it can be subjected to direct sunlight or reflections. If sharp shadow edges are visible in the camera view, the count accuracy might be less than what it normally is.
- If the camera has the Auto Gain Control (AGC) and Auto White Balance (AWB) features, disable them.

Face Counter:

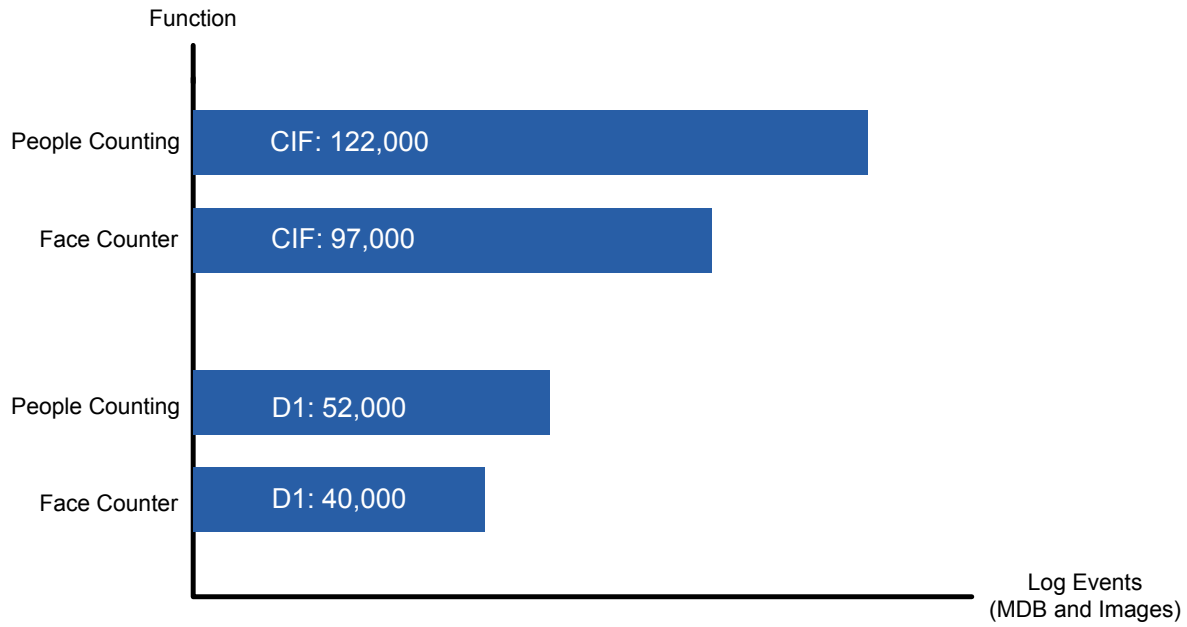
- Install the camera inside an entrance pointing horizontally outward. The face recognition function is designed to detect front-view faces only.
- Avoid installing the camera where it can be subjected to direct sunlight or reflections. The lighting of the entrance where you set the camera should be sufficient but not be too bright or dark. Light should be distributed evenly across faces without too much light coming from one side. If sharp shadow edges are visible in the camera view, the count accuracy might be less than what it normally is.

1.5 Recognition Limitations on Face Counter

- **Face Recognition Angle**: Front face only (side face cannot be recognized)
- **Face with Mask Filter**: Not recommended for people with long beard or mustache
- **Face Recognition Area Range**: The area of the detected face must take up 10% to 50% of camera view
- **Face Recognition Supported Races**: Asian or Caucasian
- **Margin of Error for Age Recognition**: ± 15

1.6 Reference for Recording Capacity of a 1G Mini SD Card

For Face Counter function, a mini SD card with 1G capacity can store approximately 40,000 log events (both MDB and images) at D1 resolution, and 97,000 log events at CIF resolution. For People Counting function, a mini SD card with 1G capacity can store approximately 52,000 log events at D1 resolution, and 122,000 log events at CIF resolution.



1.7 Options

Optional GV applications can expand your GV-Smart Box's capabilities and versatility. Contact your dealer for more information. For details on connecting to optional devices, see Chapter 7.

GV-Web Report	Through the Web browser, the GV-Web Report keeps track of and analyzes the people counting and face recognition results from GV-Smart Boxes. The integration brings you the following benefits: • Live view display from GV-Smart Boxes • Data analysis of people counts, and gender and age distribution Compatible version: V2.0 or later
GV-System	GeoVision Analog and Digital Video Recording Software. In most of documents, the GV-System also refers to **Multicam System**, **GV-NVR System** and **GV-Hybrid DVR System** at the same time. The integration brings you the following benefits: • Live view display from GV-Smart Boxes • People counting results overlaid on the live images Compatible version: V8.34 or later
GV-Compact DVR	The GV-Compact DVR is a mobile video recorder. The integration brings you the following benefit. • People counting results overlaid on the live images Compatible version: V1.03 or later

1.8 Overview

This section identifies the various components of the GV-Smart Box.

1.8.1 Front View

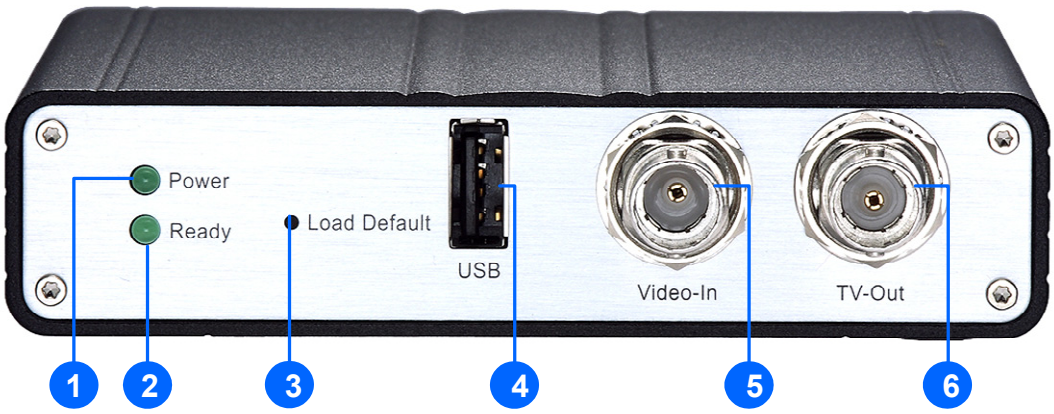


Figure 1-2

No.	Name	Function
1	Power LED	Indicates the power is supplied.
2	Ready LED	Indicates the unit is ready for connection.
3	Default Button	It resets all configurations to their factory settings. See *5.2 Restoring to Factory Default Settings*.
4	USB Port	Connects a UMTS modem. See *4.4.3 UMTS Setting*.
5	Video In	Connects a camera.
6	TV-Out	Connects an external monitor to output live videos and people counting and face recognition results immediately. It is useful when you cannot access the GV-Smart Box through the network. For details on setting the TV-Out function, see “TV OUTPUT Port Setting” in *4.1.1 Video Settings.*

1.8.2 Rear View

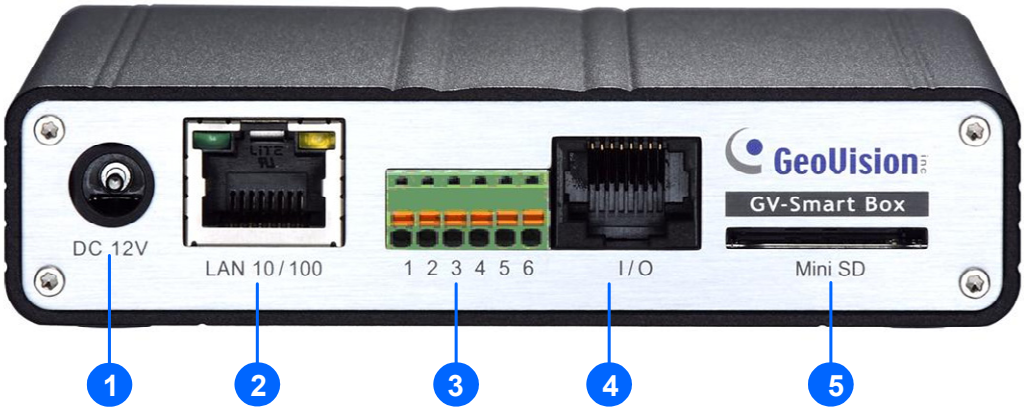


Figure 1-3

No.	Name	Function
1	DC 12V	Connects the supplied power adaptor.
2	Ethernet Port	Connects a 10/100 Ethernet network.
3	RS-485 / RS-232 Terminal Block	Connects RS-485 and RS-232 devices. See *Chapter 6 The I/O Terminal Block*. **Note:** RS-485 and RS-232 interfaces are NOT functional now.
4	I/O Port	A port for digital inputs and relay outputs. Insert the supplied **I/O Cable with RJ-45 Connector** to this port. See *Chapter 6 The I/O Terminal Block*.
5	Mini SD Card Slot	Inserts a Mini Secure Digital (SD) card. The Mini SD card is used for storing log data and images.

Chapter 2 Getting Started

This section provides basic information to get the GV-Smart Box working on the network.

2.1 Installing on a Network

These instructions describe the basic connections to install the GV-Smart Box on the network.

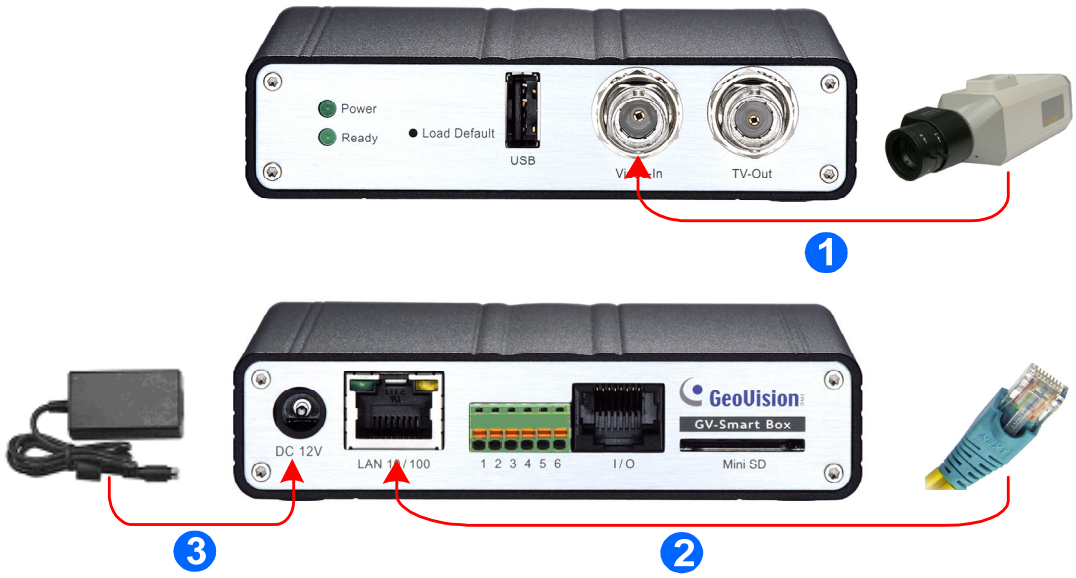


Figure 2-1

1. Connect the video output of your camera to the BNC video input.
2. Connect the hub or switch on the LAN to the unit's 10/100 Mbps Ethernet port.
3. Connect the power supply to the power input.
4. Wait until both Power and Ready LEDs are on. Then you can set the IP address for the unit.

2.2 Assigning an IP Address

Designed for use on an Ethernet network, the GV-Smart Box must be assigned an IP address to make it accessible.

Note: The GV-Smart Box has a default address of **192.168.0.230**. The computer used to set the IP address must be under the same IP and subnet sequence assigned to the unit.

---

1. Open your Web browser, and type the default IP address http://192.168.0.230/.
2. In both Login and Password fields, type the default value **admin**. Click **Apply**.
3. In the left menu, select **Network** and then **LAN** to begin the network settings.

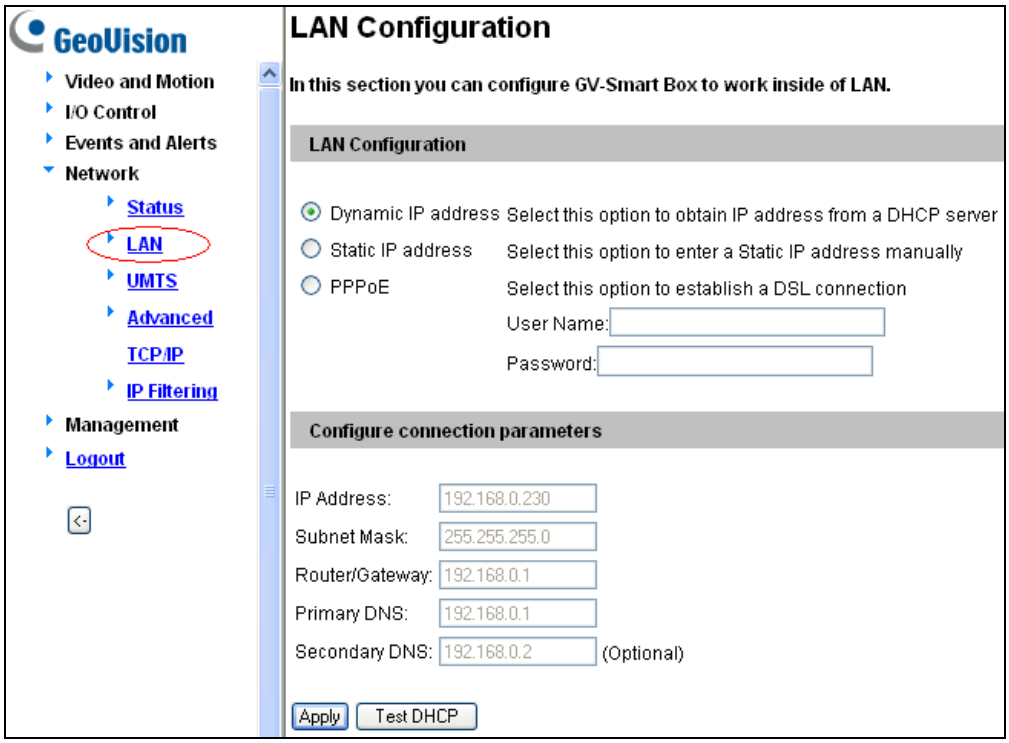


Figure 2-2

4. Select **Static IP address**. Type IP Address, Subnet Mask, Router/Gateway, Primary DNS and Secondary DNS in the **Configure connection parameters** section.
5. Click **Apply**. The GV-Smart Box is accessible by entering the assigned IP address on the Web browser.

Important:

1. **Dynamic IP Address**, **PPPoE** and **UMTS** should only be enabled if you know which IP address the GV-Smart Box will get from the DHCP server or ISP. Otherwise you must use the Dynamic DNS service to obtain a domain name linked to the GV-Smart Box's changing IP address first.

   For details on Dynamic IP Address and PPPoE settings, see *4.4.4 Advanced TCP/IP.*

2. If **Dynamic IP Address**, **PPPoE** or **UMTS** is enabled and you cannot access the unit, you may have to reset it to the factory default and then perform the network settings again.

   To restore the factory settings, see the **Default** button in *1.8.1 Front View*.

2.3 Configuring Basic Features

Once the camera is properly installed, these important features can be configured using the browser-based configuration page and are discussed in the following sections in this manual:

- **Date and time adjustment:** see *4.5.1 Date and Time Setting*.
- **Login and privileged passwords:** see *4.5.3 User Account*.
- **Network gateway:** see *4.4 Network*.
- **Video format, resolution and frame rate:** see *4.1.1 Video Settings*.

Chapter 3 Accessing the GV-Smart Box

Two types of users are allowed to log in the GV-Smart Box: Administrator and Guest. The Administrator has unrestricted access to all system configurations, while the Guest has the access to live view and network status configurations only.

Note: To access the Web interface of GV-Smart Box, make sure the Web browser you use is Internet Explorer 7 or later.

3.1 Accessing Your Surveillance Images

Once installed, your GV-Smart Box is accessible on the network. Follow these steps to access your surveillance images, people counting and face recognition results:

1. Start the Internet Explorer browser.
2. Enter the IP address or domain name of the GV-Smart Box in the **Location/Address** field of your browser.

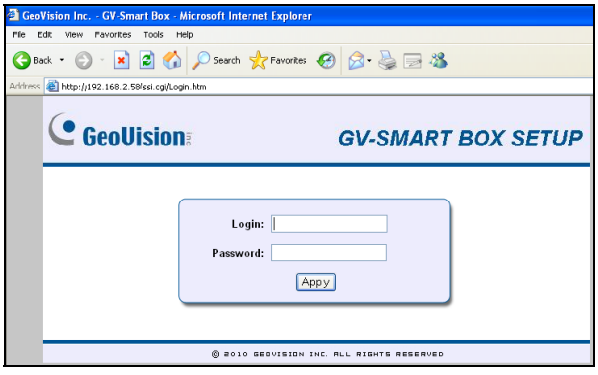


Figure 3-1

3. Enter a login name and password.
   - The default login name and password for Administrator are **admin**.
   - The default login name and password for Guest are **guest**.
4. A video image, similar to the example in Figure 3-2, is now displayed in your browser.

Note: To enable the updating of images in Internet Explorer, you must set your browser to allow ActiveX Controls and perform a one-time installation of GeoVision's ActiveX component onto your computer.

3.2 Functions Featured on the Main Page

This section introduces the features of the Live View window and Network Status on the main page. The two features are accessible by both Administrator and Guest.

Main Page of Guest Mode

▼ **Video and Motion**
- ► **Live View**

▼ **Network**
- ► **Status**

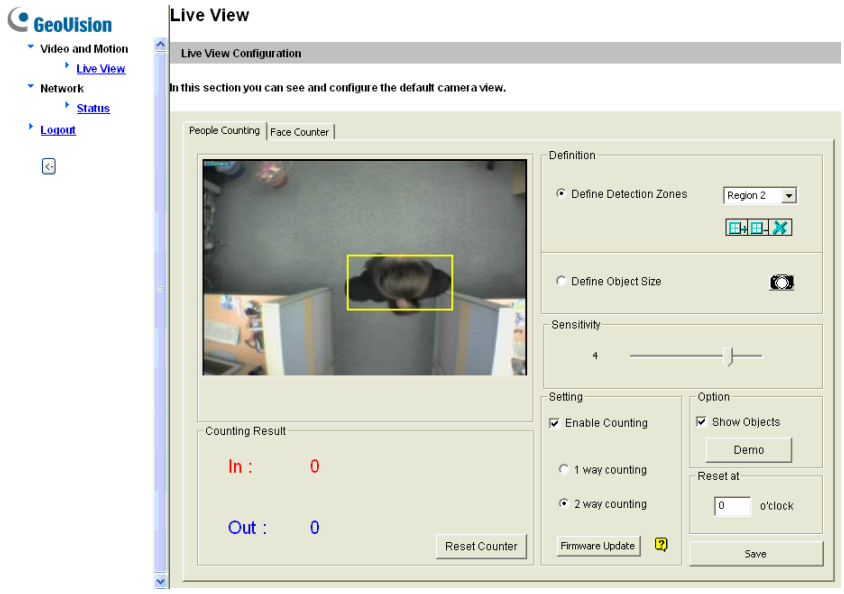


Figure 3-2

3.2.1 People Counting and Face Counter

In the Live View configuration window, the People Counting and Face Counter functions are available for configuration. These two functions cannot be enabled simultaneously. You can only enable either People Counting or Face Counter at one time. The configuration of these two functions is accessible by both Administrator and Guest.

3.2.1.1 People Counting

To configure the GV-Smart Box to count people, click the **People Counting** tab.

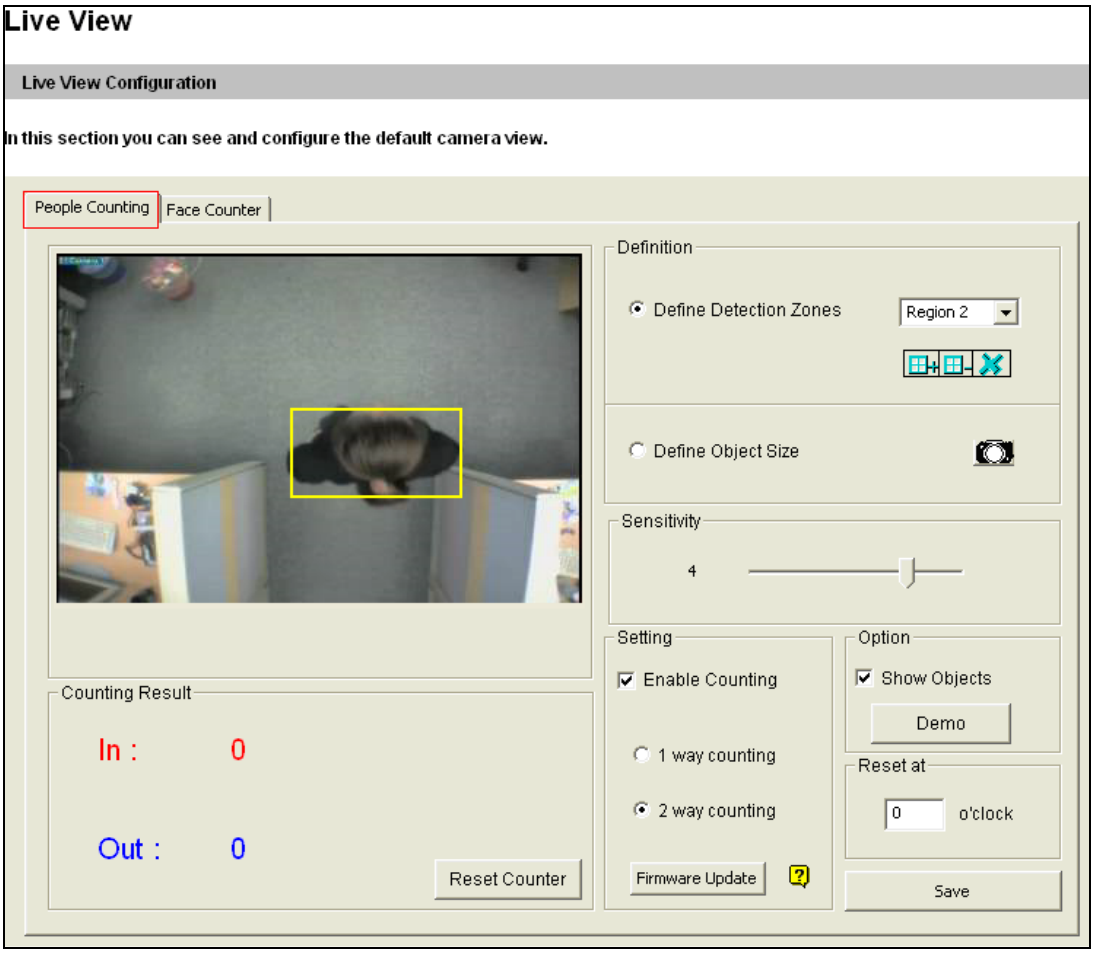


Figure 3-3

1. In the **Definition** section, there are two options:
   - **Define Detection Zones:** Use the mouse to outline detection regions on the video image. Number 1 indicates region 1, and number 2 indicates region 2. Defining multiple regions 1 and 2 is practicable. Clicking will clear all defined regions.

- **Define Object Sizes:** Use the mouse to outline a region matching the normal size of people on the video image. If the video is playing, first click the **Snapshot** button to freeze the image before defining.

2. In the **Sensitivity** section, adjust the detection sensitivity by moving the slider. The higher the value the more sensitive the system to motion. The default value is 4.
3. In the **Setting** section, select **Enable Counting** and select how you want to count the people.
   - **1 Way Counting:** When a person appears in region 1 and then enters region 2, it will be counted as 1 in.
   - **2 Way Counting:** When a person appears in region 1 and then enters region 2, it will be counted as 1 in, and when an object appears in region 2 and then enters region 1, it will be counted as 1 out.
4. In the **Reset at** section, type a reset counting time between 0 and 23. For example, if you type 23, the number of **In** and **Out** in the **Counting Result** section will become zero at 23 o'clock daily. The daily counting data will be saved in the mini SD card. The GV-Smart Box then starts counting In and Out numbers again.
5. Click the **Save** button to start the People Counting function.

Other Configurations available on this Web page:

[Setting]

- **Firmware Upgrade:** Upgrades the firmware of GV-Smart Box over LAN. See *5.1.1 Upgrading System Firmware over LAN.*

[Option]

- **Show Objects:** If you enable **Show Objects**, the defined masked regions will be displayed on the video image for your reference.
  - ⊙ **Demo:** Illustrates the optimal distance between the camera and object.

[Counting Result] Presents the number of people in or out.

- **Reset Counter:** Resets the number of **In** and **Out** to zero immediately. The counting data will be saved in the Mini SD card. The GV-Smart Box then starts counting In and Out numbers again.

Note: To get the optimal people counting results, follow the instructions to install the camera. See *1.4 Optimal Camera Installation*.

3.2.1.2 Face Counter

To configure the GV-Smart Box to count detected faces and recognize gender or age from face images, click the **Face Counter** tab.

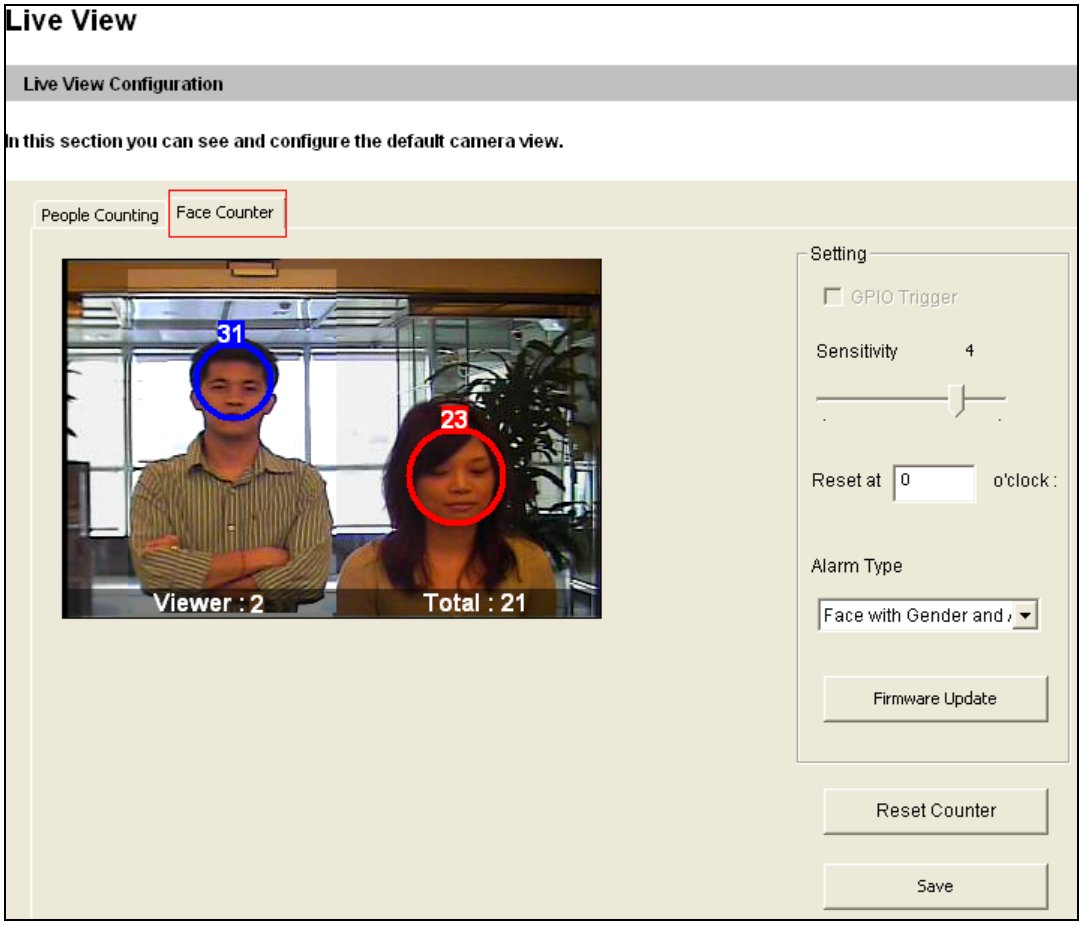


Figure 3-4

1. In the **Setting** section, there are four options:
   - **GPIO Trigger:** Select **Face with Mask Filter** from the **Alarm Type** drop-down list. Then you can enable **GPIO Trigger** to trigger the alarm when faces covered by masks are detected. To set up an input device on the GV-Smart Box, see *4.2 I/O Control*.
   - **Sensitivity:** Adjust the detection sensitivity by moving the slider. The higher the value the more sensitive the system to motion. The default value is 4.
   - **Reset at:** Type a reset counting time between 0 and 23. For example, if you type 23, the **Viewer** and **Total** numbers displayed on the bottom of the live view window will reset to 0 at 23 o'clock daily. The daily counting and face recognition data will be saved in the mini SD card.

- **Alarm Type:** Four detection alarm types are available for Face Counter:
  - **Face with Mask Filter:** Triggers alarm when faces covered with masks are detected.
  - **Face Only:** Detects and counts faces only. When a face is detected, a green circle will show in the face.
  - **Face with Gender:** Counts faces and detects genders from face images. When the gender is detected, a red or blue circle will appear on the face. Red refers to female and blue refers to male. If a green circle shows up, it means the gender cannot be recognized from the face image or the system is performing the gender recognition.
  - **Face with Gender and Age:** Counts faces and detects the age from face images. The detected age will show on the top of the detection circle.

2. Click the **Save** button to start the Face Counter function.

Other Configurations available on the page:

[Setting]

- **Firmware Upgrade:** Upgrades the firmware of GV-Smart Box over LAN. See *5.1.1 Upgrading System Firmware over LAN.*

[Reset Counter] Resets the number of **Viewer** and **Total** on the Live View window immediately. The counting data will be saved in the Mini SD card. The **Viewer** presents the current number of detected faces on the image. The **Total** presents the total number of detected faces. Up to 8 faces can be detected on the image at the same time.

Note: To get the optimal face or age recognition results, follow the instructions to install the camera. See *1.4 Optimal Camera Installation.* For details on the limitations of Face Counter function, see *1.5 Recognition Limitations on Face Counter*.

3.2.2 Network Status

To view the network status, in the left menu, click **Network** and select **Status**.

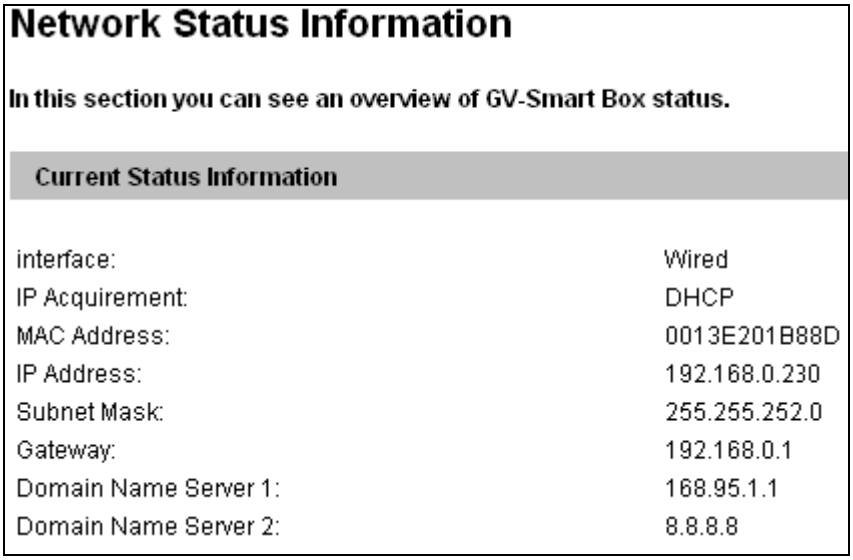

Network Status Information
In this section you can see an overview of GV-Smart Box status.
Current Status Information
interface: Wired
IP Acquirement: DHCP
MAC Address: 0013E201B88D
IP Address: 192.168.0.230
Subnet Mask: 255.255.252.0
Gateway: 192.168.0.1
Domain Name Server 1: 168.95.1.1
Domain Name Server 2: 8.8.8.8

Figure 3-5

Chapter 4 Administrator Mode

The Administrator can access the system configuration via the Internet. Five categories of configurations are included in the system configuration: **Video and Motion**, **I/O Control**, **Events and Alerts, Network**, and **Management.**

- **Video and Motion**
  - Live View
  - Video Settings
  - GV-Smart Box Settings
- **I/O Control**
  - Input Setting
  - Output Setting
- **Events and Alerts**
  - Compact DVR Setting
  - Web Report Setting
  - Inquire Database
- **Network**
  - Status
  - LAN
  - UMTS
  - Advanced TCP/IP
  - IP Filtering
- **Management**
  - Date and Time
  - Storage Settings
  - User Account
  - Log Information
  - Tools
- **Logout**

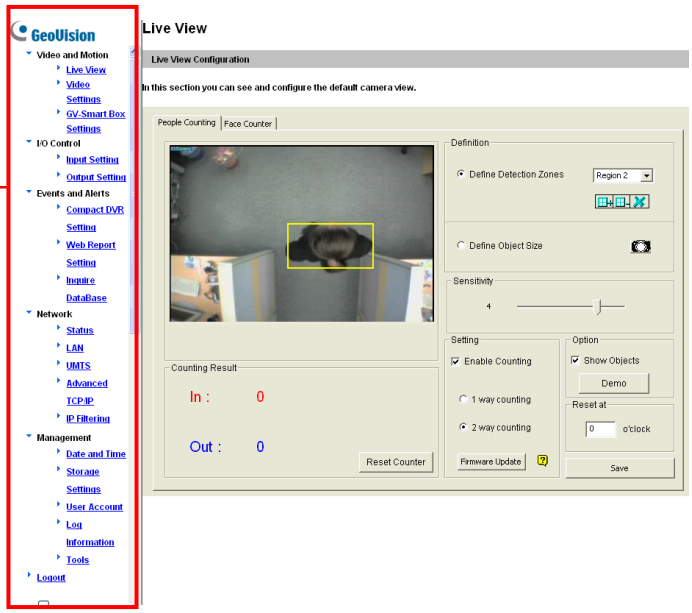


Figure 4-1

4.1 Video and Motion

This section introduces Video Settings and GV-Smart Box Settings (GV-System connection settings) that allow you to customize People Counting and Face Counter functions.

4.1.1 Video Settings

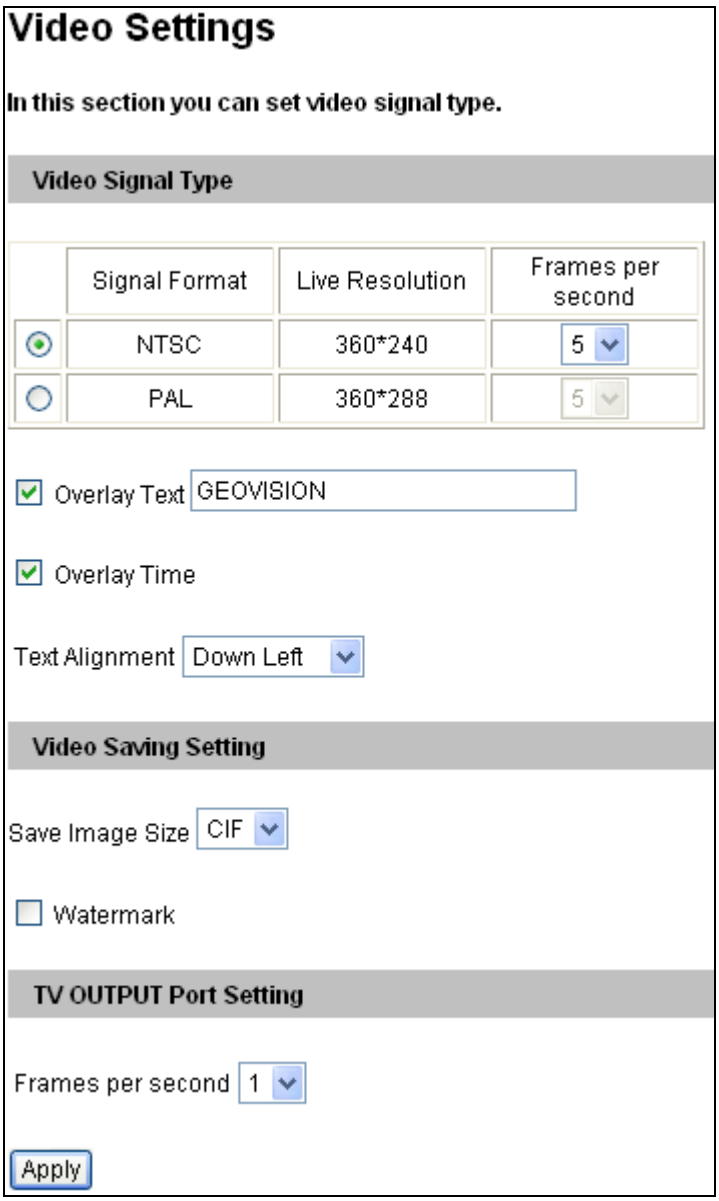


Figure 4-2

[Video Signal Type] The GV-Smart Box supports both NTSC and PAL video signals. Select either **NTSC** or **PAL**.

The live resolution is set to be 360 x 240 (NTSC) or 360 x 288 (PAL). There are several frame rates available.

Frame Rate	**NTSC**	1, 3, 5
	PAL	1, 3, 5

- **Overlay Text:** Enter a text message that will be overlaid on live and captured images, e.g. company name.
- **Overlay Time:** Select this option to display the time stamp on live and captured images.
- **Text Alignment:** Select a position for the text and time stamp to appear on live and captured images, e.g. down left, down right, top left or top right.

[Video Saving Setting]

- **Save Image Size:** Select the size of the captured image to be saved to the mini SD card. There are two options: CIF and D1.
- **Watermark:** Enable the watermark overlay to appear on captured images. For details on the watermark, see *5.3 Verifying Watermark*.

[TV Output Port Setting] The GV-Smart Box allows the direct connection of an external monitor to output live images and counting results immediately. When the unit is installed at a place where the network is not accessible, the TV-Out port can be used for camera adjustment to ensure the image of people or face is captured properly. Select the frame rate of 1 or 5 for the TV output.

4.1.2 GV-Smart Box Settings

The GV-Smart Box can connect to the GV-System. For details on the connection, see *7.2 Connecting to GV-System*.

Once you have connected the GV-Smart Box to the GV-System, the live images of the GV-Smart Box will be transmitted to the GV-System, and the people counting results can be overlaid on the live images as well.

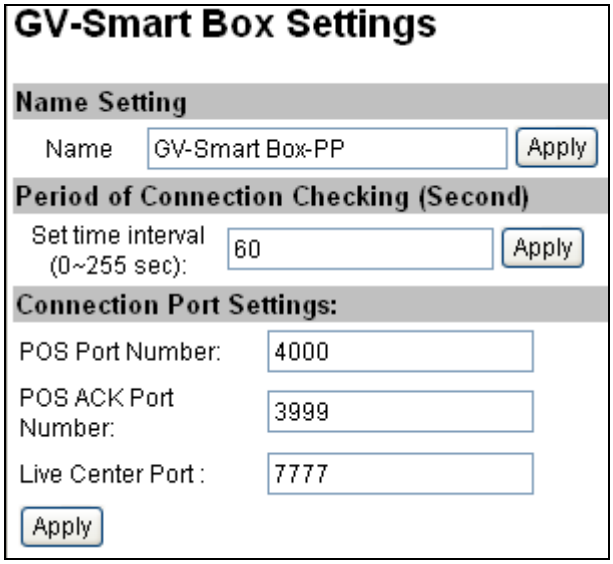


Figure 4-3

[Name Setting] Type a descriptive name for the GV-Smart Box.

[Period of Connection Checking] Set the time interval in seconds between each reconnection attempt.

[Connection Port Settings] Both **POS Port** and **POS ACK Port** are used for transmitting the counting results to the GV-System. The default port numbers are 4000 and 3999 respectively.

The **Live Center Port** is used for accessing the Web interface of GV-Smart Box on the browser. When you want to access Web interfaces of multiple units of GV-Smart Box on the same computer, set different Live Center Ports for each GV-Smart Box; otherwise you cannot access more than one GV-Smart Box at the same time.

4.2 I/O Control

The I/O terminal block on the rear panel of GV-Smart Box provides the interface for digital inputs and relay outputs. For details on the I/O terminal block, see *Chapter 6.*

4.2.1 Input Setting

The GV-Smart Box can connect up to 2 input devices, e.g. sensors.

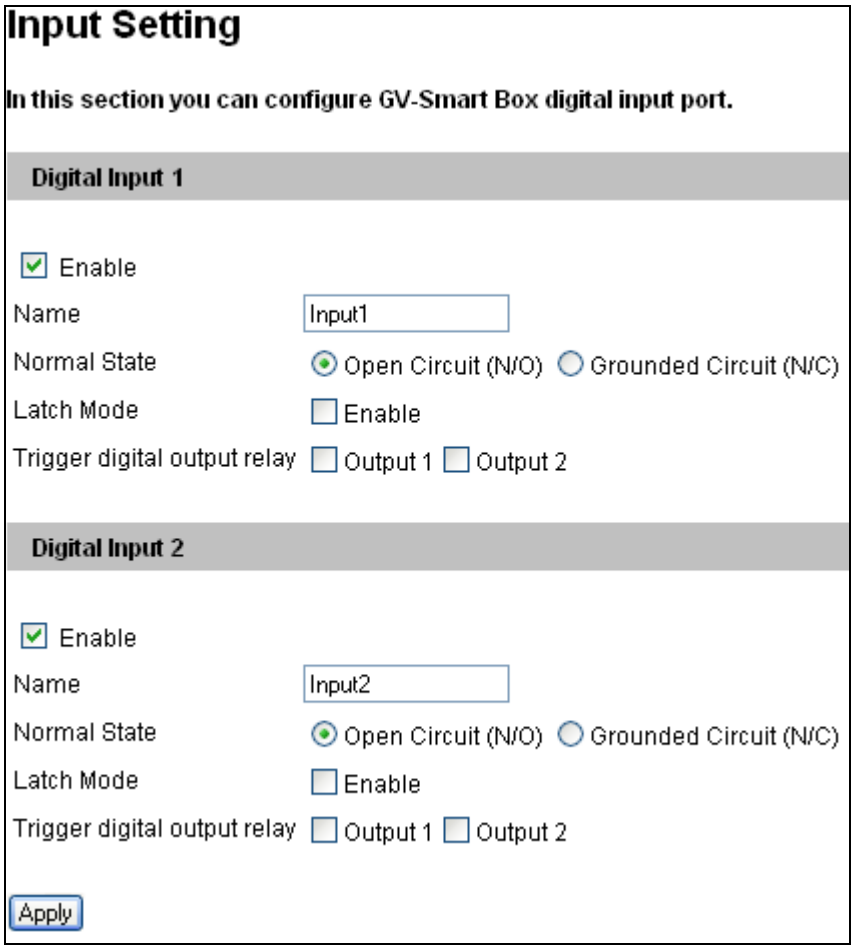


Figure 4-4

- **Name:** Type a descriptive name for the input device.
- **Normal State:** Set up the input state to trigger actions by selecting **Open Circuit (N/O)** or **Grounded Circuit (N/C)**.
- **Latch Mode:** Enable this option to have a momentary output alarm.
- **Trigger digital output relay:** Select the output(s) to be triggered after the input is activated.

4.2.2 Output Setting

The GV-Smart Box can connect up to 2 output devices, e.g. alarms.

There are six output signals available: N/O (Open Circuit), N/C (Grounded Circuit), N/O Toggle, N/C Toggle, N/O Pulse and N/C Pulse. Choose the one that best suits the device you are using. For **Toggle** output type, the output continues to be triggered until a new input trigger ends the output. For **Pulse** output type, the output is triggered for the amount of time you specify in the **Trigger Pulse Mode for x seconds** field.

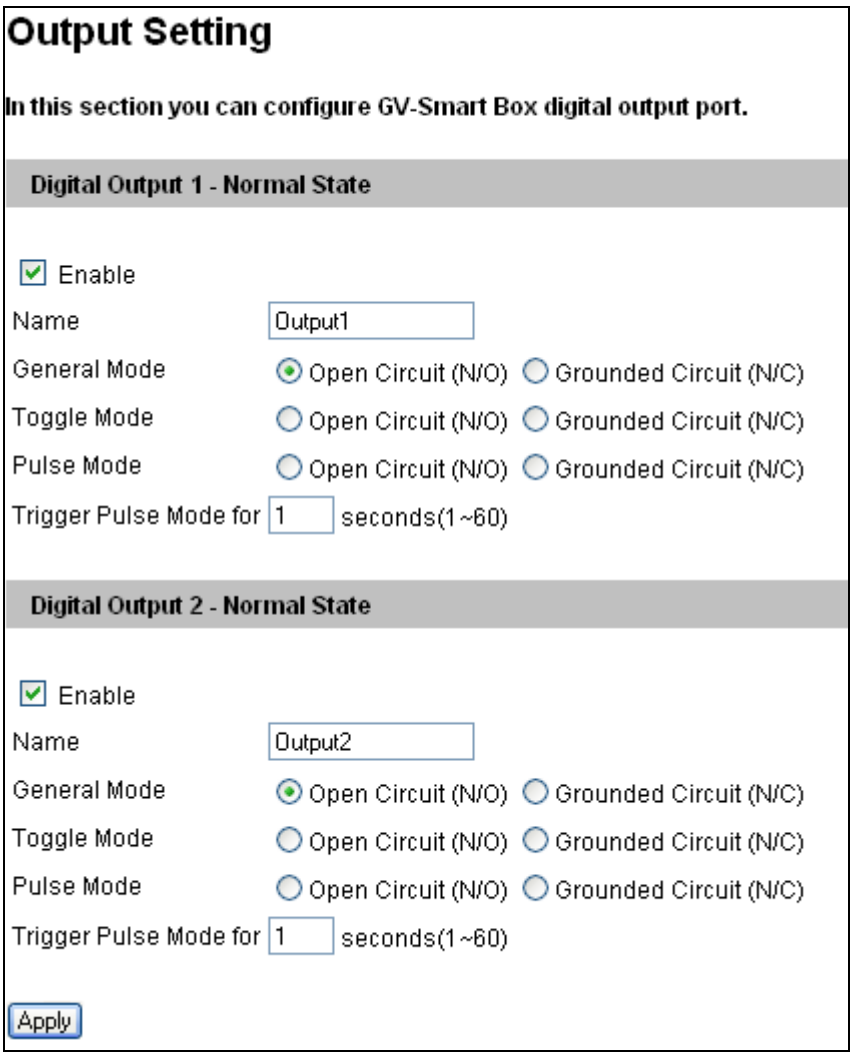


Figure 4-5

4.3 Events & Alerts

4.3.1 Compact DVR Setting

The GV-Smart Box can connect to the GV-Compact DVR. For details on the connection, see *7.3 Connecting to GV-Compact DVR*.

Type the IP address, port number, user name and password of the GV-Compact DVR. Select one channel of the GV-Compact DVR to overlay the people counting results on the channel. The default port number is 10000.

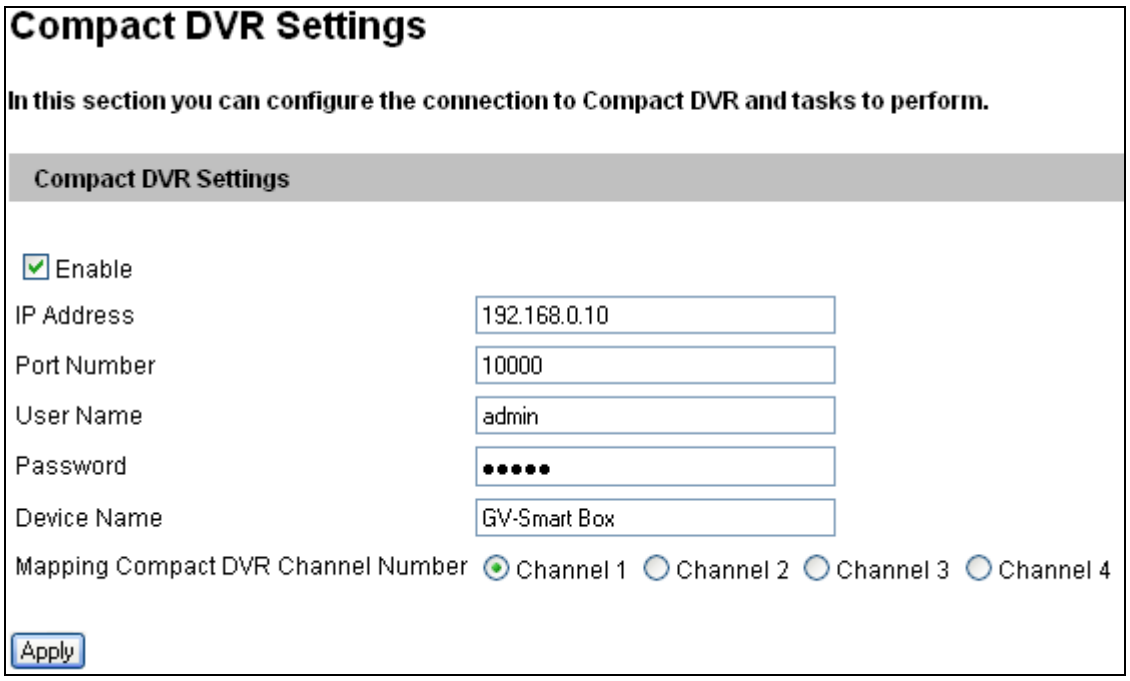


Figure 4-6

4.3.2 Web Report Setting

The GV-Smart Box can connect to the GV-Web Report. For details on the connection, see *7.1 Connecting to GV-Web Report*.

Type the host name or IP address, port number, user name and password of the GV-Web Report and click **Apply**. The default port number is 30000.

You can click **Export all** button if the network was interrupted to resend all data to the GV-Web Report.

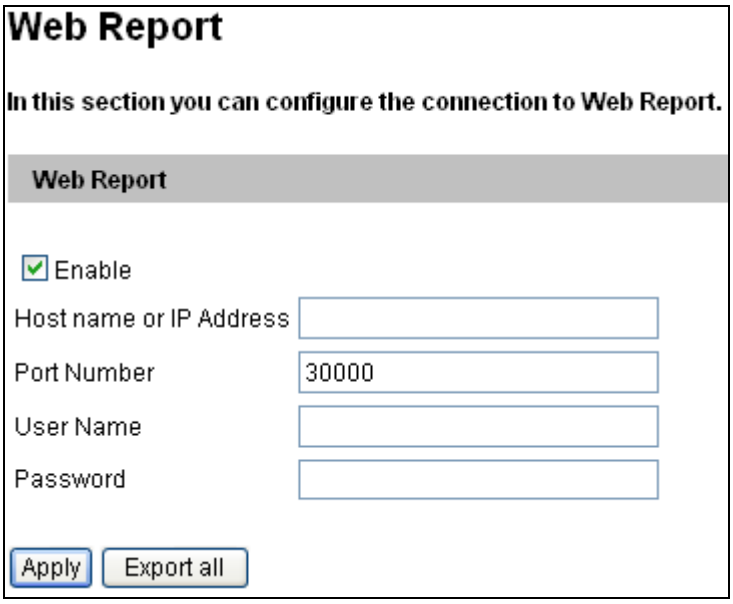


Figure 4-7

4.3.3 Database Inquiry

You can query people counting and face recognition data from the mini SD card. In addition, the people counting results can be presented in statistical diagrams.

Note: The log data is recorded in the mini SD card. Make sure you have inserted the mini SD card into the GV-Smart Box before you query the data.

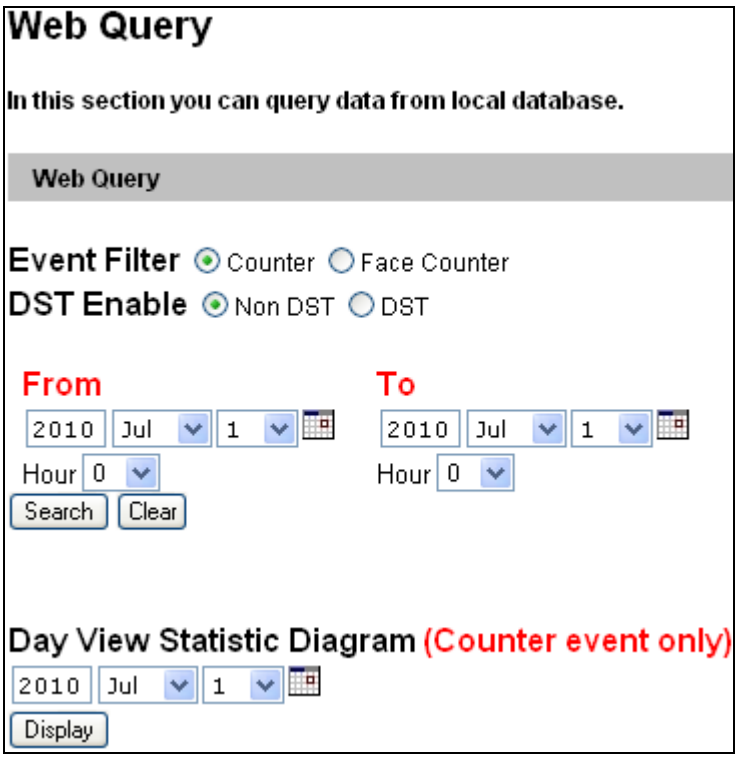


Figure 4-8

Querying Data

To query log data of People Counting:

1. Select **Counter** from the **Event Filter**.
2. If you want to query log events recorded during the Daylight Saving Time period, select **DST** from the **DST Enable**; otherwise, select **Non DST**.
3. Select time period and click **Search**. This log event list appears.

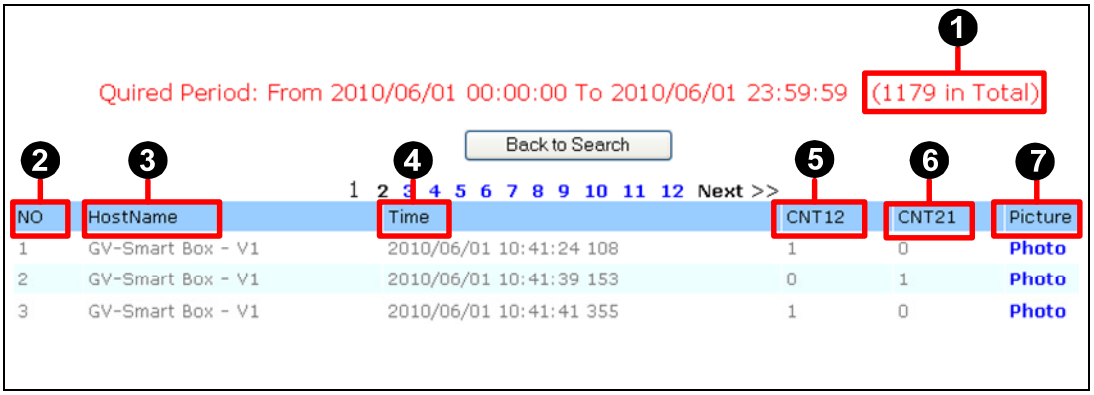


Figure 4-9

Up to 100 log events can be listed on each page. You can click **Photo** to see the snapshot of the log event.

No.	Description
1	Display the total number of people counted within the queried period.
2	Display numbers of events.
3	Display the host name of the GV-Smart Box.
4	Display the time of the event.
5	Display the number of people in.
6	Display the number of people out.
7	Click to display the snapshot of the event.

To query log data of Face Counter:

1. Select **Face Counter** from the **Event Filter**.
2. If you want to query log events recorded during the Daylight Saving Time period, select **DST** from the **DST Enable**; otherwise, select **Non DST**.
3. Select time period and click **Search**. This log event list appears.

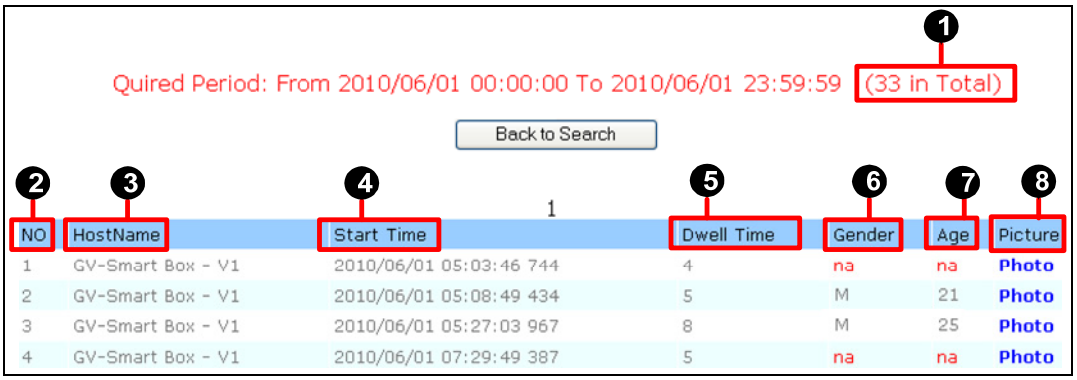


Figure 4-10

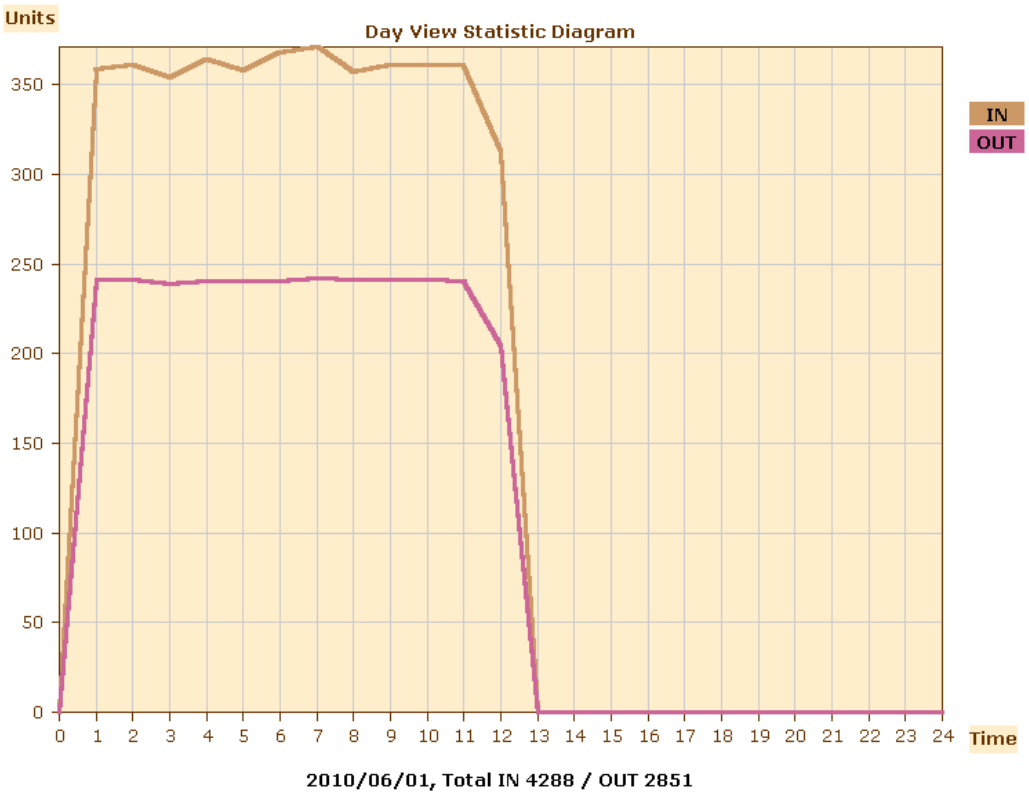
Up to 100 log events can be listed on each page. You can click **Photo** to see the snapshot of the log event.

No.	Description
1	Display the total number of the detected faces within the queried period.
2	Display numbers of events.
3	Display the host name of the GV-Smart Box.
4	Display the start time of the event.
5	Display the recognition time spent on the event.
6	Display the gender of the recognized face. M refers to male and F refers to female. Na means the gender cannot be recognized from face images.
7	Display the age of the recognized face. Na means the age cannot be recognized from face images.
8	Click to display the snapshot of the event.

Producing Statistic Diagrams

The GV-Smart Box can present the people counting results in a diagram. You can only query the People Counting log events on a specified date. Select the desired date and click **Display**. The following diagram appears.

You can easily see the peak time of people counting results in the statistical diagram. The hourly numbers of people in and out are illustrated both in the diagram and the table.



Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
In	359	361	354	364	358	368	371	357	361	361	361	313	0	0	0	0	0	0	0	0	0	0	0	0
Out	241	241	239	240	240	240	242	241	241	241	240	205	0	0	0	0	0	0	0	0	0	0	0	0

Figure 4-11

4.4 Network

The **Network** section includes some basic but important network configurations that enable the GV-Smart Box to be connected to a TCP/IP network.

4.4.1 LAN

According to your network environment, select among Static IP, DHCP, PPPoE and UMTS.

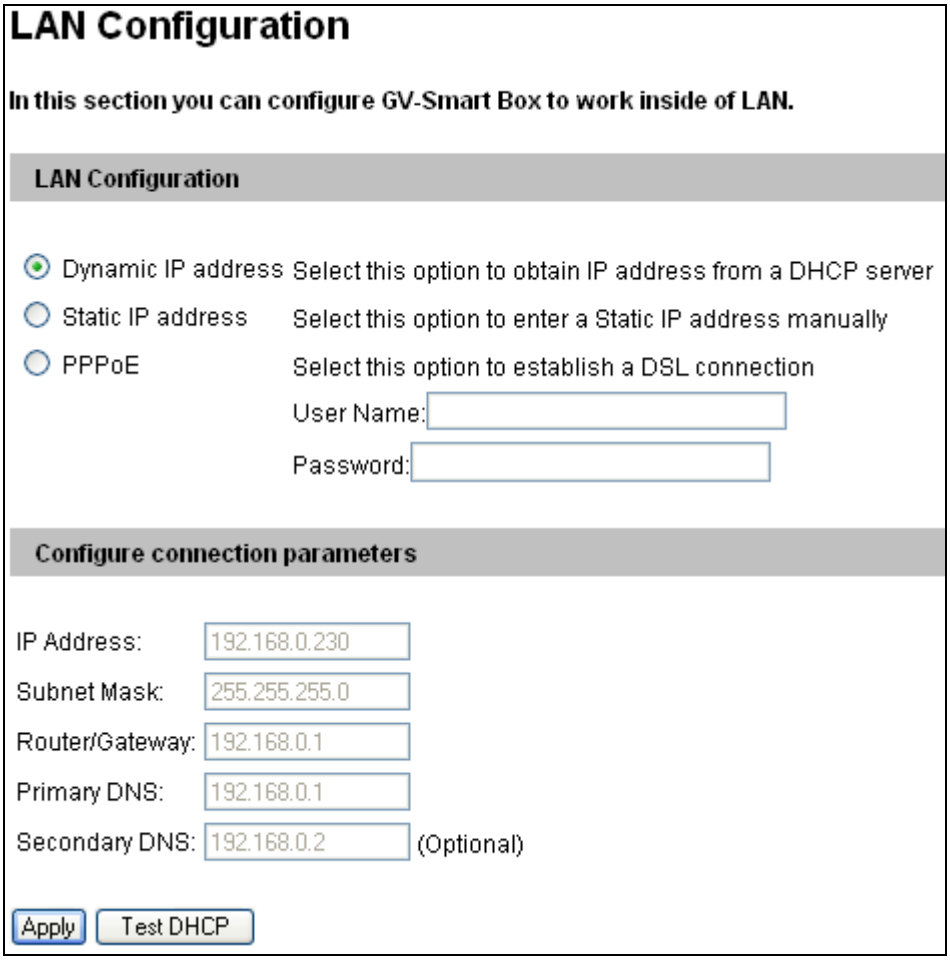


Figure 4-12

[LAN Configuration]

- **Dynamic IP address:** The network environment has a DHCP server. This option should only be enabled if you know which IP address the GV-Smart Box will get from the DHCP server, or you have obtained a domain name from the DDNS service provider.
- **Static IP address:** Assign a static IP or fixed IP to the GV-Smart Box. Type TCP/IP and DNS parameters of the unit in the **Configure connection parameters** section.

- **PPPoE:** The Network environment is xDSL connection. Type the Username and Password provided by ISP to establish the connection. If you use the xDSL connection with dynamic IP addresses, you must use the DDNS function to obtain a domain name linked to the changing IP address of the GV-Smart Box first.

[Configure connection parameters] Type the IP address, Subnet Mask, Router/Gateway, Primary DNS server and Secondary DNS server of the GV-Smart Box.

Parameters	Default
IP address	192.168.0.230
Subnet Mask	255.255.255.0
Router/Gateway	192.168.0.1
Primary DNS server	192.168.0.1
Secondary DNS server	192.168.0.2

For details on the DDNS function (Dynamic DNS Server)*, see 4.4.4 Advanced TCP/IP.*

4.4.2 UMTS

UMTS stands for Universal Mobile Telephone System. UMTS is a third-generation (3G) broadband, packet-based transmission of text, digitized voice, video, and multimedia at data rates up to 2 megabits per second. UMTS offers a consistent set of services to mobile computer and phone users, no matter where they are located in the world.

After a mobile broadband device (supporting UMTS, HSDPA, etc.) is attached to the USB port on the front panel and the UMTS function is enabled, the GV-Smart Box can have wireless broadband access. For supported mobile broadband devices, see *Appendix*.

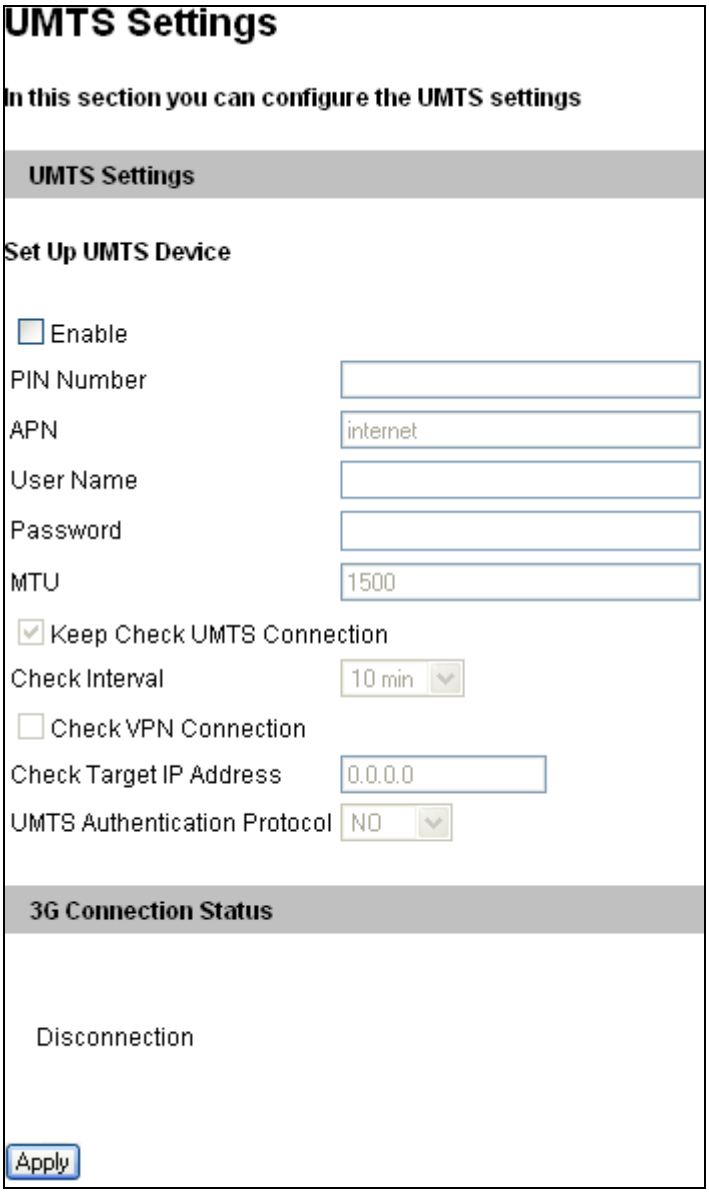


Figure 4-13

[UMTS Settings]

- **PIN Number:** Type the PIN number that is provided by your network operator.
- **APN:** Type the Access Point Name that is provided by your network operator.
- **Username:** Type a valid username to enable the UMTS service from your network operator.
- **Password:** Type a valid password to enable the UMTS service from your network operator.
- **MTU:** Type the Maximum Transfer Unit. The default value is 1500.
- **Keep Check UMTS Connection:** Select this option to check the UMTS connection status and use the drop-down list to specify the desired time length for check frequency.
- **Check VPN Connection:** Select this option to check the VPN (Virtual Private Network) connection status. To check the IP address, type the target IP address in the **Check Target IP Address** field.
- **UMTS Authentication Protocol:** Use the drop-down list to select the UMTS Authentication Protocol provided by your network operator.

[3G Connection Status] Indicates the connection status of UMTS or VPN.

4.4.3 Advanced TCP/IP

This section introduces the advanced TCP/IP settings, including DDNS Server and HTTP port.

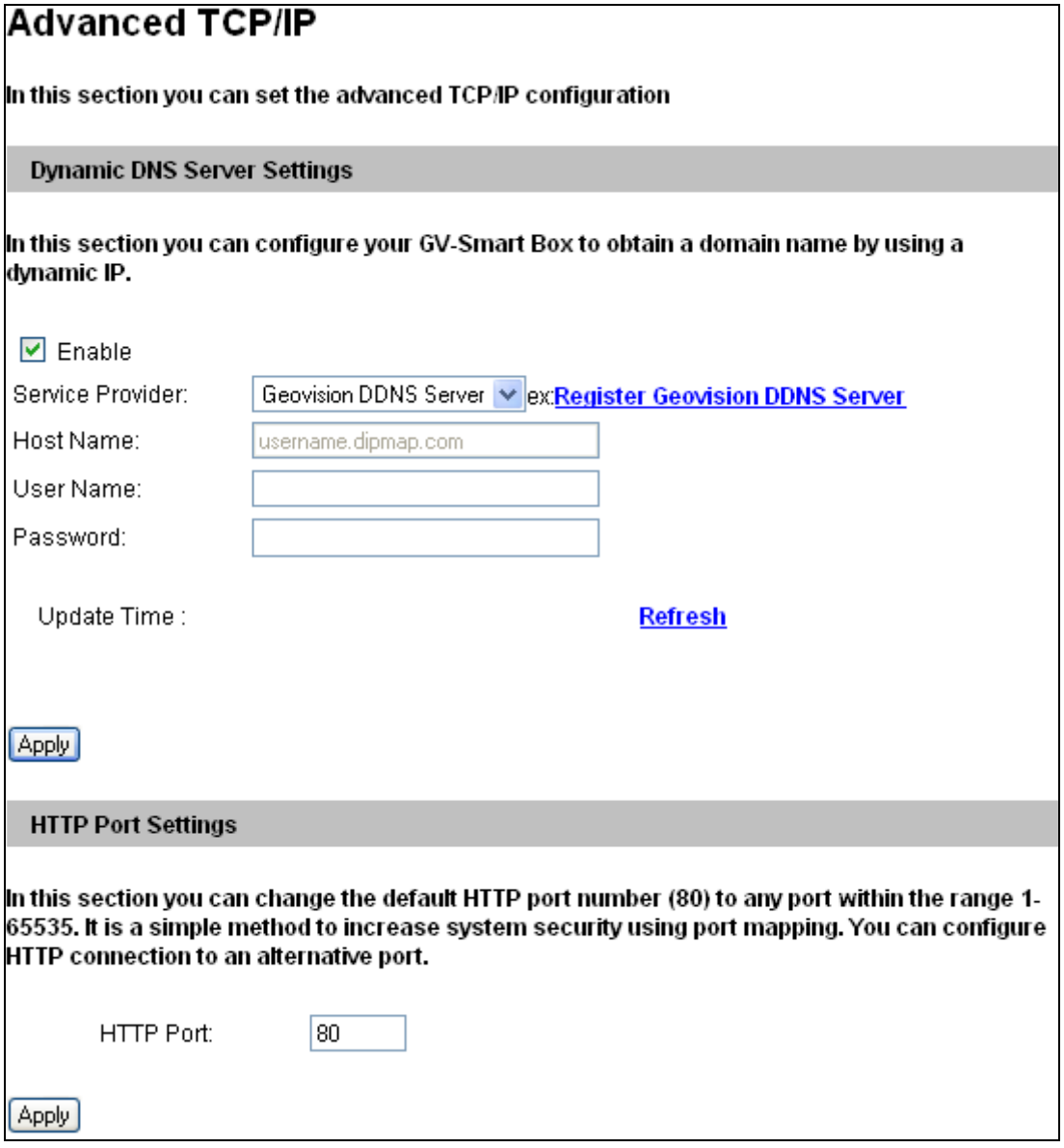

Advanced TCP/IP
In this section you can set the advanced TCP/IP configuration
Dynamic DNS Server Settings
In this section you can configure your GV-Smart Box to obtain a domain name by using a dynamic IP.
Enable
Service Provider:
Geovision DDNS Server
ex:Register Geovision DDNS Server
Host Name:
username.dipmap.com
User Name:
Password:
Update Time :
Refresh
Apply
HTTP Port Settings
In this section you can change the default HTTP port number (80) to any port within the range 1-65535. It is a simple method to increase system security using port mapping. You can configure HTTP connection to an alternative port.
HTTP Port:
80
Apply

Figure 4-14

[Dynamic DNS Server Settings] DDNS (Dynamic Domain Name System) provides a convenient way of accessing the GV-Smart Box when using a dynamic IP. DDNS assigns a domain name to the GV-Smart Box, so that the Administrator does not need to go through the trouble of checking if the IP address assigned by DHCP Server or ISP (in xDSL connection) has changed.

Before enabling the DDNS function, the Administrator should apply for a host name from the DDNS service provider's website. There are 2 providers listed in the GV-Smart Box: GeoVision DDNS Server and DynDNS.org.

To enable the DDNS function:

1. **Enable:** Enable the DDNS function.
2. **Service Provider:** Select the DDNS service provider you have registered with.
3. **Host Name:** Type the host name used to link to the GV-Smart Box. For the users of GeoVision DDNS Server, it is unnecessary to enter the host name. The system will detect the host name automatically.
4. **User Name:** Type the user name used to enable the service from the DDNS.
5. **Password:** Type the password used to enable the service from the DDNS.
6. Click **Apply**. The Update Time from the DDNS will be displayed.

[HTTP Port Settings]

The HTTP port enables connecting the GV-Smart Box to the Web. For security integration, the Administrator can hide the server from the general HTTP port by changing the default HTTP port of 80 to a different port number within the range of 1024 through 65535.

4.4.4 IP Filter Setting

The Administrator can set IP filtering to restrict access to the GV-Smart Box.

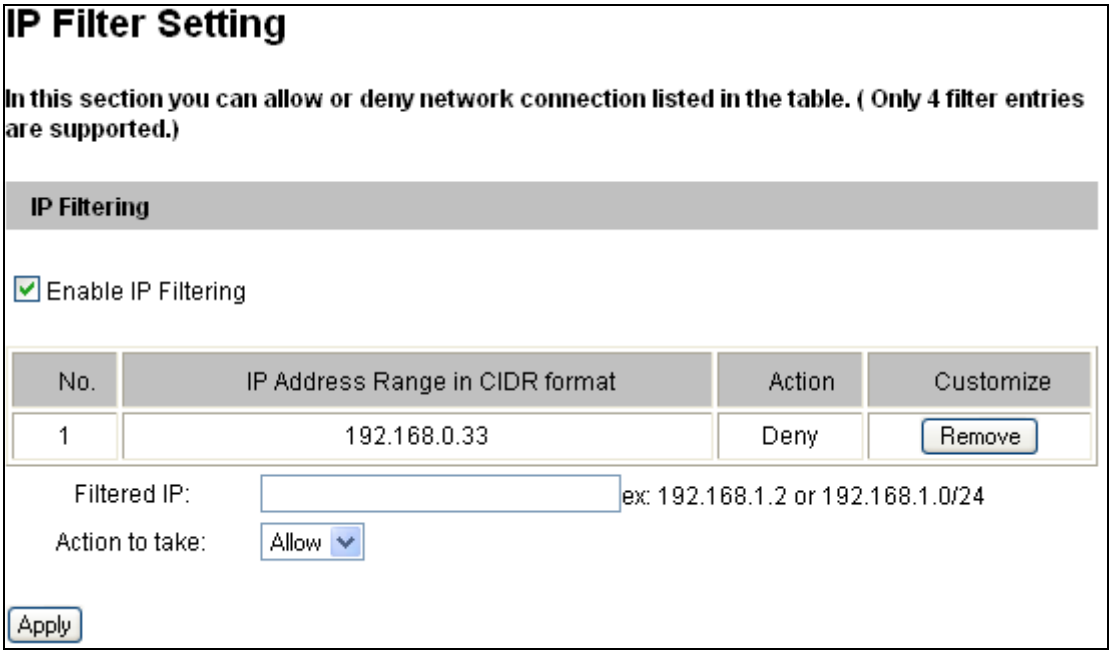


Figure 4-15

To enable the IP Filter function:

1. **Enable IP Filtering:** Enable the IP Filtering function.
2. **Filtered IP:** Type the IP address you want to allow or deny.
3. **Action to take:** Select the action of **Allow** or **Deny** to be taken for the IP address you have specified.
4. Click **Apply**.

4.5 Management

The **Management** section includes the settings of date and time, SD card and user account. Also you can view the firmware version and execute certain system operations.

4.5.1 Date & Time Setting

You can set up the date and time appearing in the image's caption.

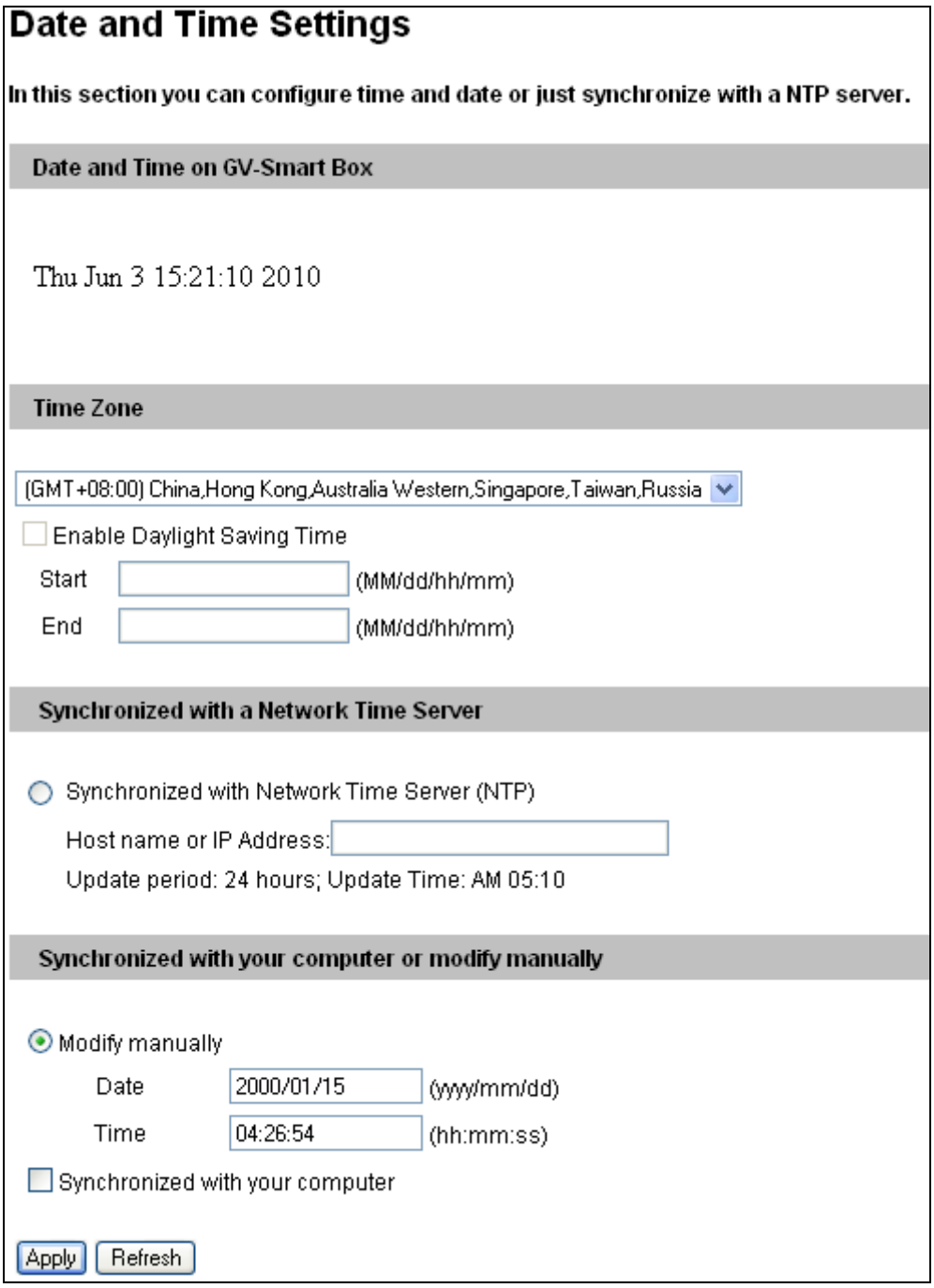


Figure 4-16

[Date & Time on GV-Smart Box] Display the current date and time on the GV-Smart Box.

[Time Zone] Set the time zone for local settings. Select **Enable Daylight Saving Time** to automatically adjust the GV-Smart Box for daylight saving time. Type the Start Time and End Time to enable the daylight saving function.

[Synchronized with a Network Time Server] Use the NTP server to automatically update the date and time of the GV-Smart Box every 24 hours. Type the host name or the IP address of the NTP server for connection.

[Synchronized with your computer or modify manually] Manually change the date and time of the GV-Smart Box. Or, synchronize the date and time of the GV-Smart Box with the local computer. The default date and time setting is set to modify manually. The default date is 2000/01/15, while the default time is 04:26:54.

4.5.2 Storage Settings

The GV-Smart Box has one SD card slot. You can store the counting and recognition results or images to the SD card. The image is stored in the JPEG compressed format.

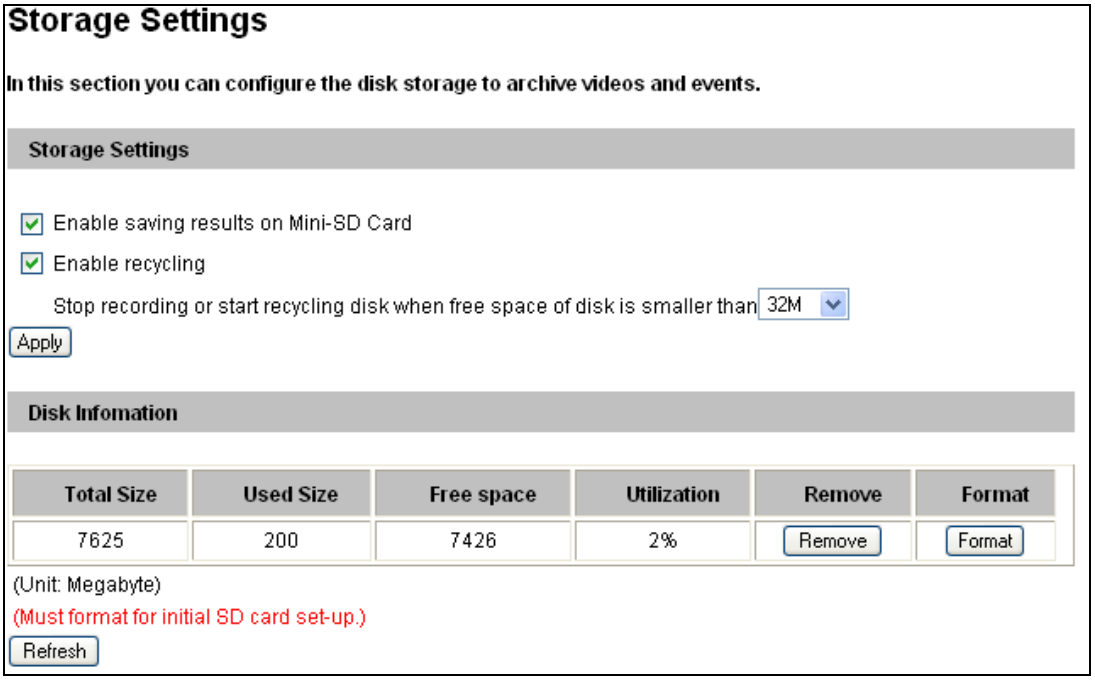


Figure 4-17

To add a SD card:

1. Insert a SD card to the SD card slot.
2. Click the **Refresh** button to detect the SD card. The total size, used size, free space and utilization of the SD card will be displayed. Note that it may take several seconds for your Web browser to update the information from the SD card.
3. If you like to format the SD card or erase all data stored on it, click the **Format** button.

To remove a SD card:

1. Click the **Remove** button.
2. When you are prompted to confirm the action, click **Yes**. The page will be refreshed and the partition information will be cleaned.
3. Remove the SD card from the SD card slot.

Note: The captured images may be lost if you do not remove the SD card properly.

[Storage Settings]

- **Enable saving results on SD Card:** Enable this option to save the counting and recognition results and images onto the SD card.
- **Enable recycling:** If this option is checked, the system will overwrite the oldest stored files when the space of the SD card is lower than the specified space. If this option is not checked, the system will stop recording when the specified space is reached.

Note: The GV-Smart Box does not support SD High Capacity (SDHC) cards.

4.5.3 User Account

The GV-Smart Box has two types of password protection: Guest password for restricting unwanted users from accessing the GV-Smart Box, and Administrator password for restricting who can enter privileged commands.

Default Guest login name and password are **guest.** Default Administrator login name and password are **admin.**

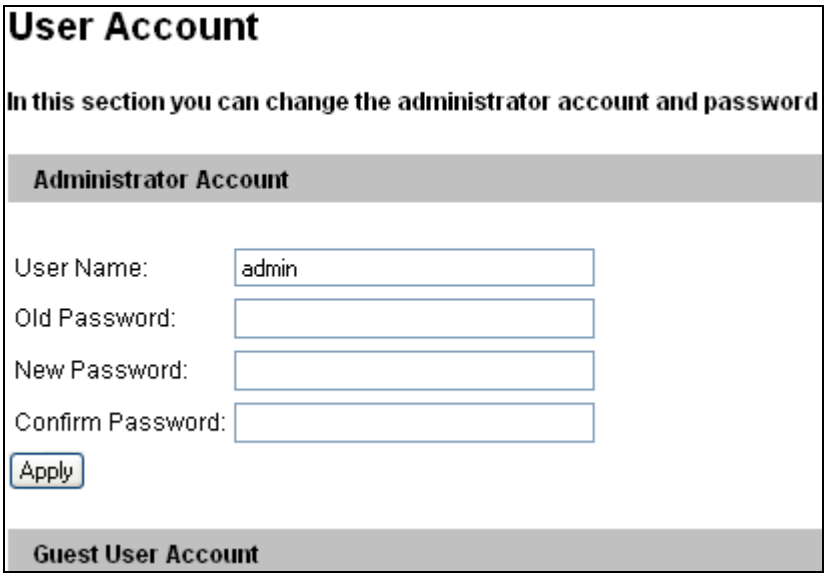


Figure 4-18

4.5.4 Log Information

The log contains dump data that is used by service personnel for analyzing problems.

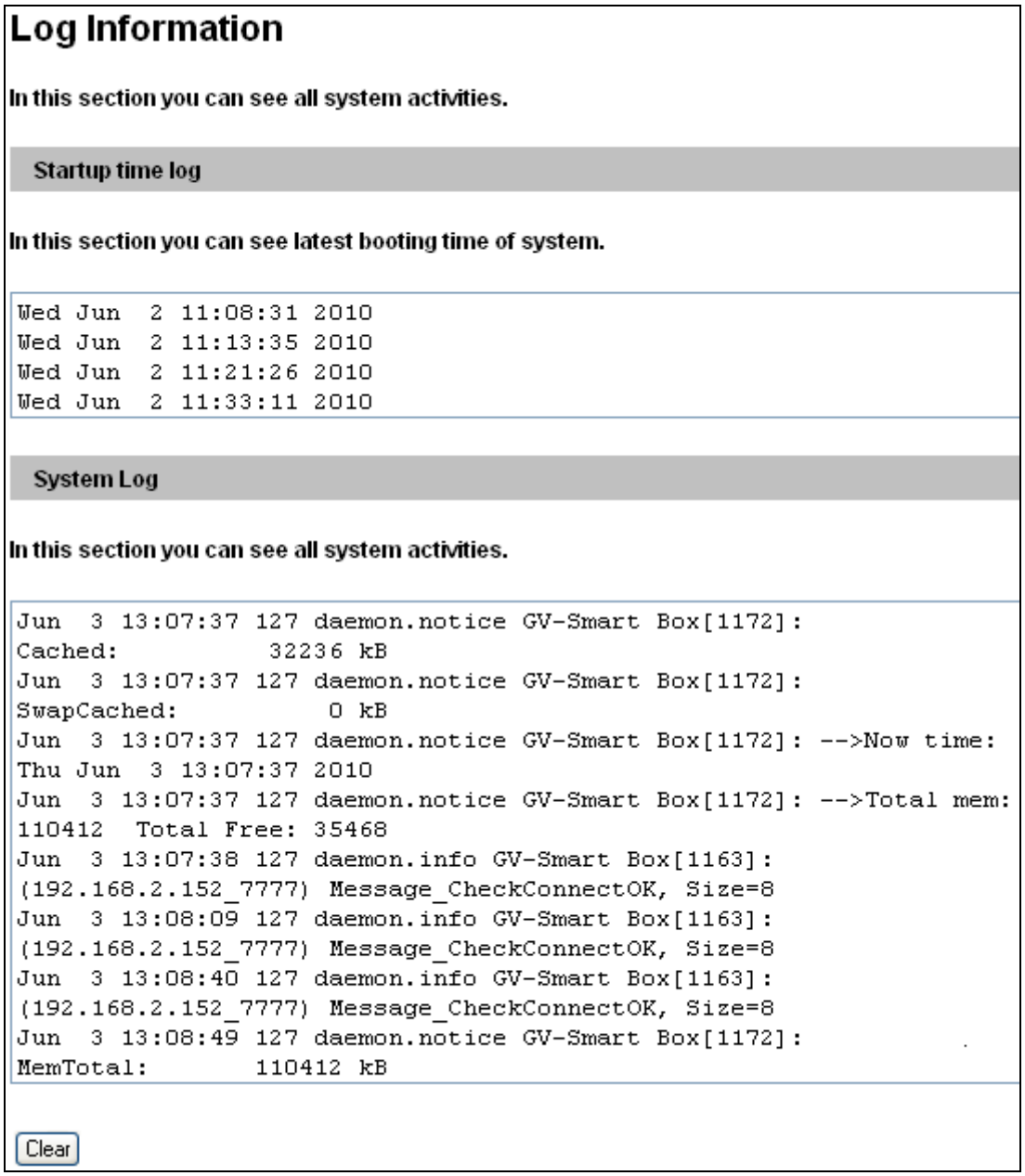

Log Information
In this section you can see all system activities.
Startup time log
In this section you can see latest booting time of system.
Wed Jun 2 11:08:31 2010
Wed Jun 2 11:13:35 2010
Wed Jun 2 11:21:26 2010
Wed Jun 2 11:33:11 2010
System Log
In this section you can see all system activities.
Jun 3 13:07:37 127 daemon.notice GV-Smart Box[1172]:
Cached: 32236 kB
Jun 3 13:07:37 127 daemon.notice GV-Smart Box[1172]:
SwapCached: 0 kB
Jun 3 13:07:37 127 daemon.notice GV-Smart Box[1172]: -->Now time:
Thu Jun 3 13:07:37 2010
Jun 3 13:07:37 127 daemon.notice GV-Smart Box[1172]: -->Total mem:
110412 Total Free: 35468
Jun 3 13:07:38 127 daemon.info GV-Smart Box[1163]:
(192.168.2.152_7777) Message_CheckConnectOK, Size=8
Jun 3 13:08:09 127 daemon.info GV-Smart Box[1163]:
(192.168.2.152_7777) Message_CheckConnectOK, Size=8
Jun 3 13:08:40 127 daemon.info GV-Smart Box[1163]:
(192.168.2.152_7777) Message_CheckConnectOK, Size=8
Jun 3 13:08:49 127 daemon.notice GV-Smart Box[1172]:
MemTotal: 110412 kB
Clear

Figure 4-19

4.5.5 Tools

This section allows you to execute certain system operations and view the firmware version.

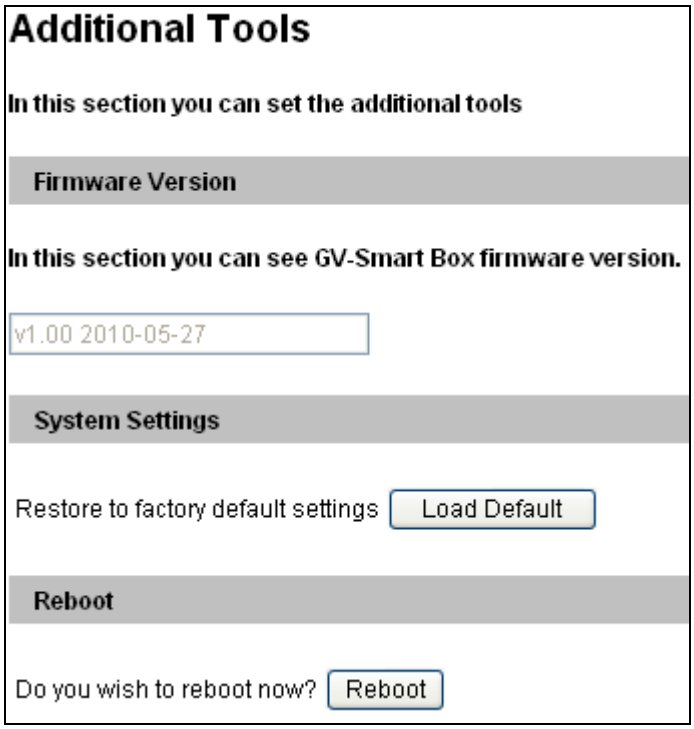


Figure 4-20

[Firmware Version] This section displays the firmware version of the GV-Smart Box.

[System Settings] Clicking the **Load Default** button will restore the GV-Smart Box to factory default settings. The Ready LED on the front panel will turn off. Wait until the Ready LED turns on and then you can re-log in the GV-Smart Box.

Note: After applying default settings, you will need to configure the GV-Smart Box's network settings again.

[Reboot] Clicking the **Reboot** button will make the GV-Smart Box perform software reset. The Ready LED on the front panel will turn off. Wait until the Ready LED turns on and then you can re-log in the GV-Smart Box.

Chapter 5 Advanced Applications

This chapter introduces more advanced applications.

5.1 Upgrading System Firmware

GeoVision will periodically release updated firmware on the website. The new firmware can be simply loaded into the GV-Smart Box over LAN or by using the IP Device Utility included in the Software DVD.

Important Notes before You Start

Before you start updating the firmware, please read these important notes:

1. While the firmware is being updated,
   A. the power supply must not be interrupted, and
   B. do not unplug the Ethernet cable if the cable is the source of power supply (Power over Ethernet or PoE supported).
2. Do not turn the power off for 5 minutes after the firmware is updated.
3. If you use the IP Device Utility for firmware upgrade, the computer used to upgrade firmware must be under the same IP and subnet sequence of the GV-Smart Box.

WARNING: Interruption of power supply during updating causes not only update failures but also damages to your GV-Smart Box. In this case, please contact your sales representative and send your device back to GeoVision for repair.

5.1.1 Upgrading Firmware over LAN

1. In the Live View window (People Counting or Face Counter), click the **Firmware Upgrade** button. This dialog box appears.

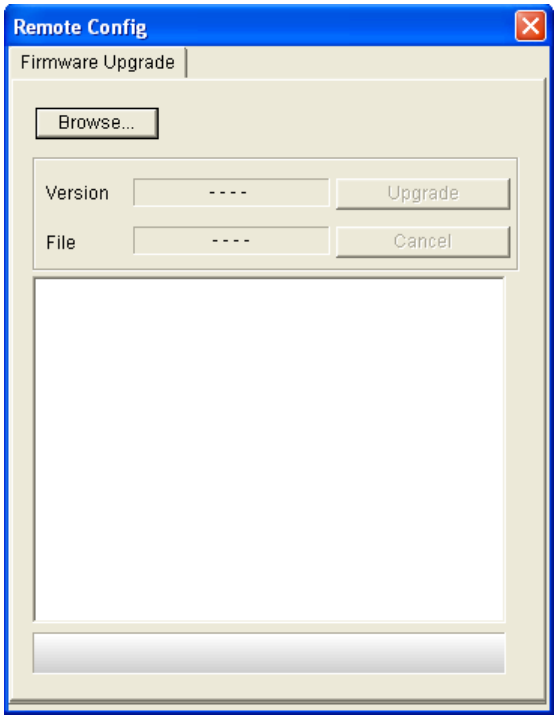


Figure 5-1

2. Click the **Browse** button to locate the firmware file (.img) saved at your local computer.
3. Click the **Upgrade** button to begin upgrading.

5.1.2 Upgrading Firmware by Using the Utility

The IP Device Utility provides a direct way to upgrade the firmware to multiple GV-Smart Boxes. Note the computer used to upgrade firmware must be under the same IP and subnet sequence of the GV-Smart Box.

1. Insert the Software DVD, select **IP Device Utility**, and follow the onscreen instructions to install the program.

2. Double-click the **GV IP Device Utility** icon created on your desktop. This dialog box appears.

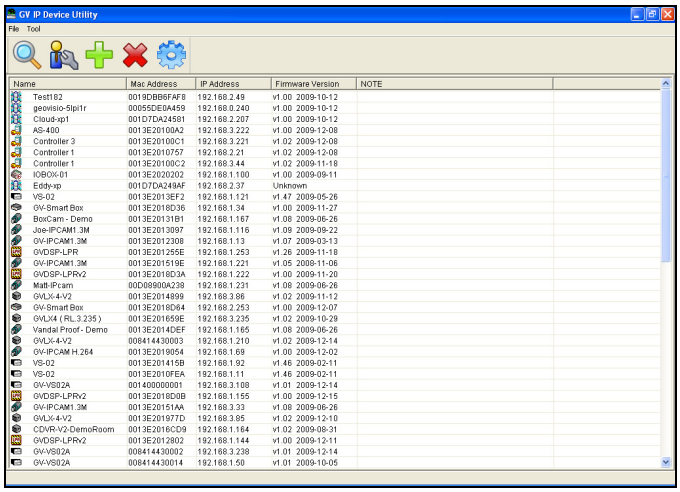


Figure 5-2

3. Click the **Search** button to locate the available GV-Smart Boxes on the same LAN.

   Or click the **New** button and assign the IP address to locate a GV-Smart Box over the Internet. Or highlight one GV-Smart Box in the list and click the **Delete** button to remove it.

4. Double-click one GV-Smart Box in the list. This dialog box appears.

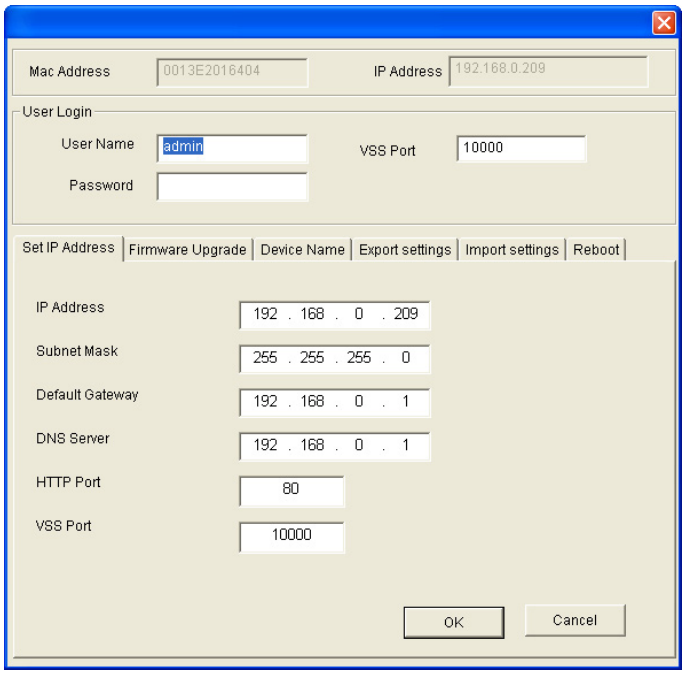


Figure 5-3

5. Click the **Firmware Upgrade** tab. This dialog box appears.

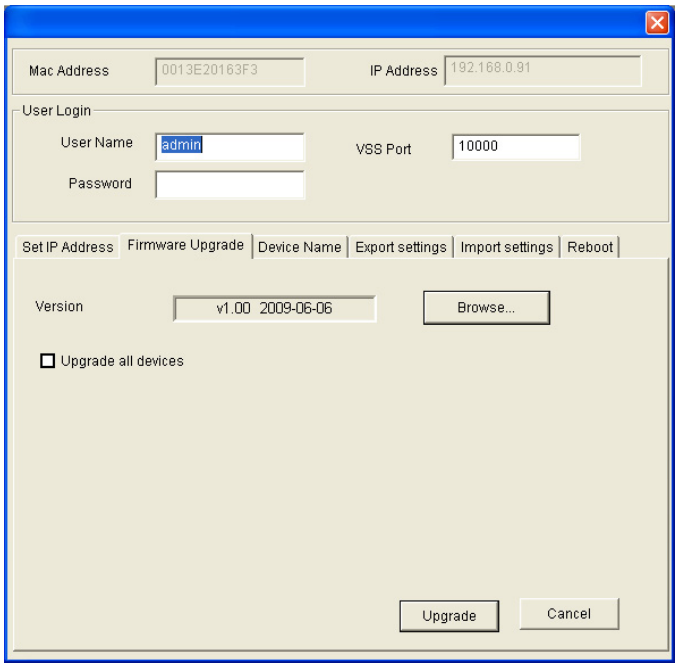


Figure 5-4

6. Click the **Browse** button to locate the firmware file (.img) saved at your local computer.
7. If you like to upgrade all the GV-Smart Boxes in the list, select **Upgrade all devices**.
8. Type **Password**, and click **Upgrade** to process the upgrade.

5.2 Backing Up and Restoring Settings

With the IP Device Utility included in the Software DVD, you can back up the configurations in the GV-Smart Box, and restore the backup data to the current unit or import it to another unit.

Backing Up the Settings

1. Run **IP Device Utility** and locate the desired GV-Smart Box. See Steps 1-3 in *5.1.2 Upgrading Firmware by Using the Utility*.
2. Double-click the GV-Smart Box in the list. Figure 5-3 appears.
3. Click the **Export Settings** button. This dialog box appears.

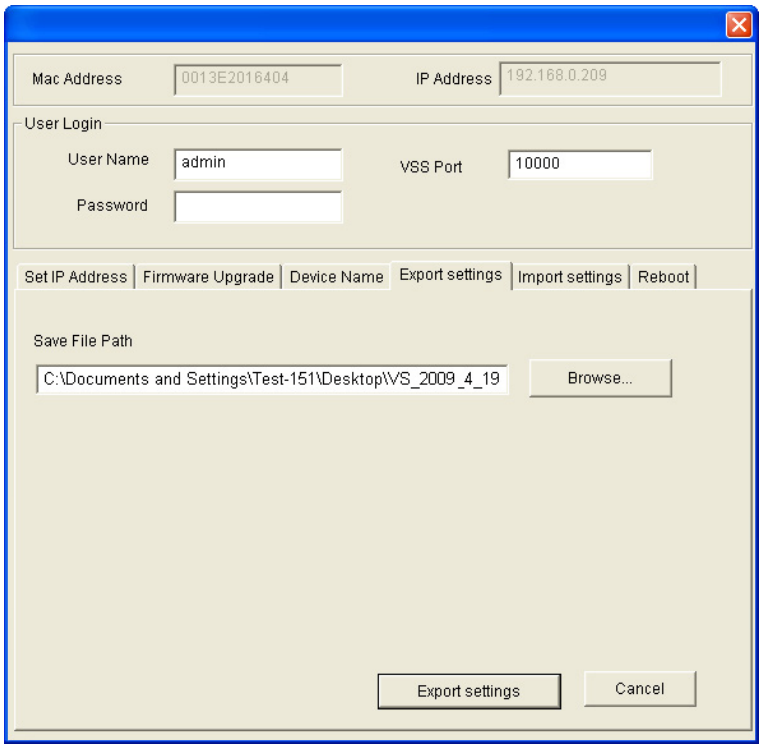


Figure 5-5

4. Click the **Browse** button to assign a file path.
5. Type **Password**, and click **Export Settings** to save the backup file.

Restoring the Settings

1. In Figure 5-3, click the **Import Settings** tab. This dialog box appears.

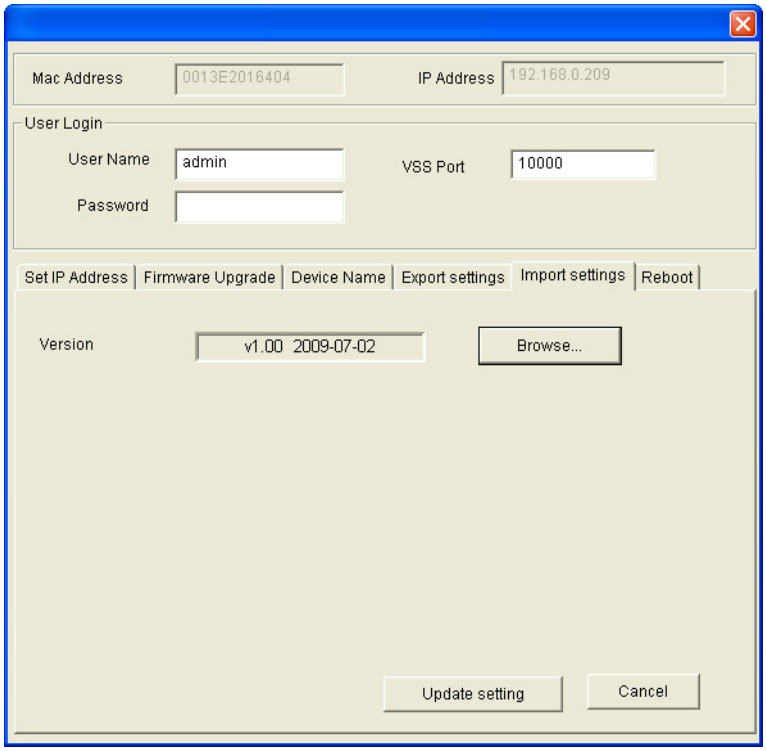


Figure 5-6

2. Click the **Browse** button to locate the backup file (.dat).
3. Click **Update Settings** to start restoring.

5.3 Restoring to Factory Default Settings

To restore to default settings, use the **Load Default** button on the front panel of GV-Smart Box. See No. 3, Figure 1-1.

1. Unplug and plug the power cable. The Ready LED turns off.
2. Press and hold the **Load Default** button until the Ready LED turns on.
3. Release the **Load Default** button. The process of loading default values is complete, and the GV-Smart Box starts rebooting itself.

Note: Before **Ready LED** is on again, do not unplug the power cable; otherwise the loading of default values will fail.

5.4 Verifying Watermark

The watermark is an encrypted and digital signature embedded in the video stream during the compression stage, protecting the video from the moment of its creation. Watermarking ensures that an image is not edited or damaged after it is recorded. To enable the watermark function, see [Video Saving Setting], *4.1.1 Video Settings*.

The **Watermark Proof** is a watermark-checking program. It can verify the authenticity of the recording before you present it in court. To verify watermark, first you have to access the image files recorded in the SD card.

5.4.1 Running Watermark Proof

1. Install **Watermark Proof** from the Software DVD. After installation, a **WMProof** icon is created on your desktop.
2. Double-click the icon created. The Water Mark Proof window appears.
3. Click **File** from the menu bar, select **Open** and locate the recorded image file. The selected file is then listed on the window. Alternatively, you can drag the file directly from the storage folder to the window.
4. If the recording is unmodified, a check will appear on the **Pass** column; otherwise a check will appear on the **Failed** column.

5.4.2 The Watermark Proof Window

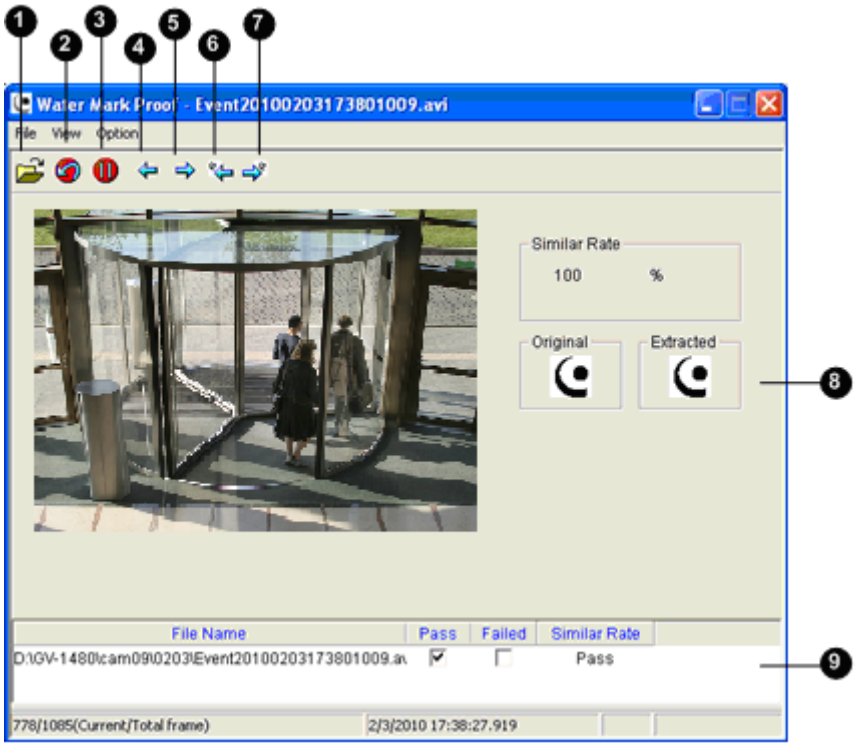


Figure 6-10

The controls in the window:

No.	Name	Description
1	Open File	Opens the recorded file.
2	First Frame	Goes to the first frame of the file.
3	Play	Plays the file.
4	Previous Frame	Goes to the previous frame of the file.
5	Next Frame	Goes to the next frame of the file.
6	Previous Watermarked Frame	Goes to the previous frame that contains watermark.
7	Next Watermarked Frame	Goes to the next frame that contains watermark.
8	Original vs. Extracted	The Extracted icon should be identical with the Original icon. If not, it indicates the recording has been tampered.
9	File List	Displays the proof results.

Chapter 6 The I/O Terminal Block

6.1 I/O Port

GV-Smart Box provides the **I/O Cable with RJ-45 Connector** for the extensible connection to other I/O devices. A RJ-45 connector and a bundle of shielded wires are on the each end of the cable.

Strip the desired wires first, and connect the auxiliary devices with the right wires according to the following pin assignment. Then insert the RJ-45 Connector to the **I/O Port** on GV-Smart Box (No. 4, Figure 1-3).

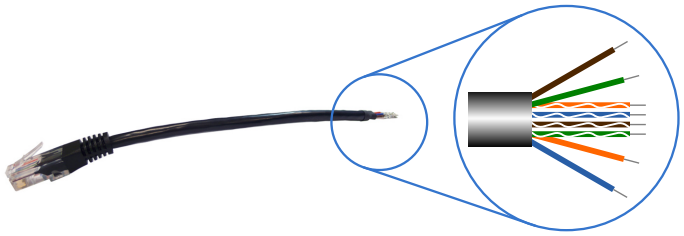


Figure 6-1

Pin Assignment

The table below lists the pin assignment for the shielded wires of the **I/O Cable with RJ-45 Connector**.

Pin	Wire	Function
1	Brown	Digital Out 1
2	White with Brown Stripe	Digital Out 2
3	White with Green Stripe	Ground
4	White with Blue Stripe	Digital In 1
5	Blue	Digital In 2
6	Green	Ground
7	Orange	Weigand D0
8	White with Orange Stripe	Weigand D1

Note: The Weigand interface is NOT functional now.

Relay Output

The relay outputs on the terminal block can only drive a maximum load of 5 volts. Working in conjunction with the GV-Relay V2 module, it can drive heavier loads. Refer to the figure and table below to connect the GV-Relay V2 module to the GV-Smart Box.

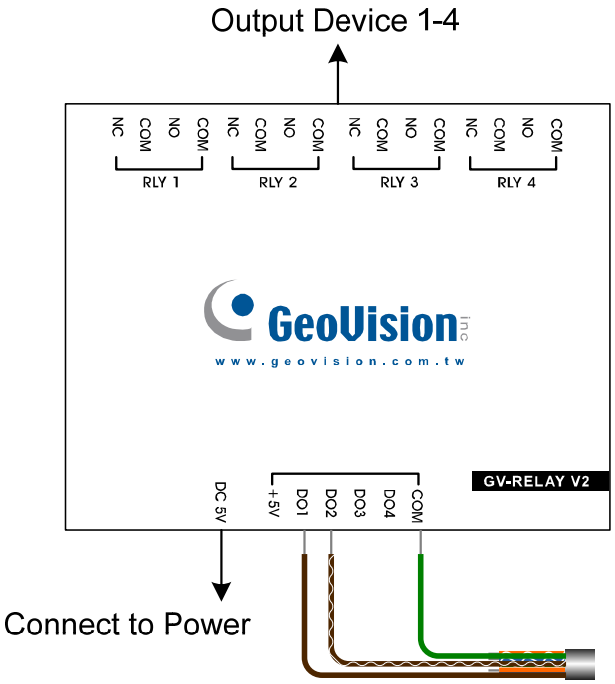


Figure 6-2

GV-Relay V2	Wire
DO 1	Brown
DO 2	White with Brown Stripe
COM	Green

Note: The GV-Relay V2 module is an optional product.

6.2 RS-485/RS-232 Terminal Block

The 6-pin terminal block, located on the rear panel, provides the RS-485 and RS-232 interfaces.

Note: RS-485 and RS-232 interfaces are NOT functional now.

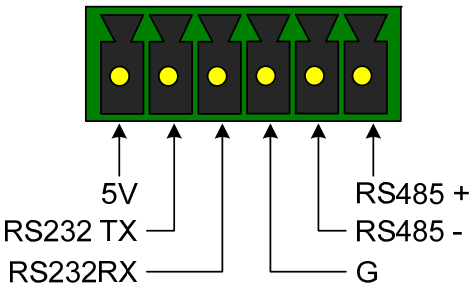


Figure 6-3

Pin	Function
5V	DC 5V Out
TX	RS-232 TX (Transmit)
RX	RX-232 RX (Receive)
G	Ground
RS-485 +	RS-485 +
RS-485 -	RS-485 -

Chapter 7 Integration with other GV Applications

The GV-Smart Box can integrate with GV applications such as GV-Web Report, GV-System and GV-Compact DVR for viewing live images, and receiving counting or face recognition results.

Compatible Versions:

- **GV-Web Report:** V2.0 or later
- **GV-System:** V8.34 or later
- **GV-Compact DVR:** V1.03 or later

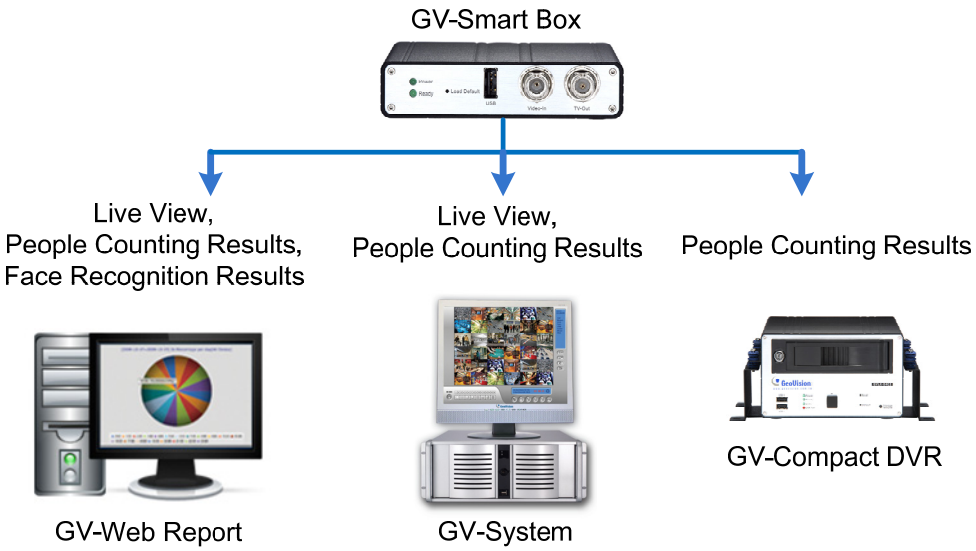


Figure 7-1

7.1 Connecting to GV-Web Report

The integration enables the GV-Web Report to keep track of and analyze the face counting and face recognition results from the GV-Smart Box. To connect to the GV-Web Report, follow the steps below:

1. Enable GV-Web Report function on the Web interface of the GV-Smart Box (Figure 4-7).
2. Type the host name or IP address, port number, user name and password of the GV-Web Report and click **Apply**. The default port number is 30000.
3. On the main screen of GV-Web Report, click **Service** and select **Data Service** to start receiving data from the connected GV-Smart Box.

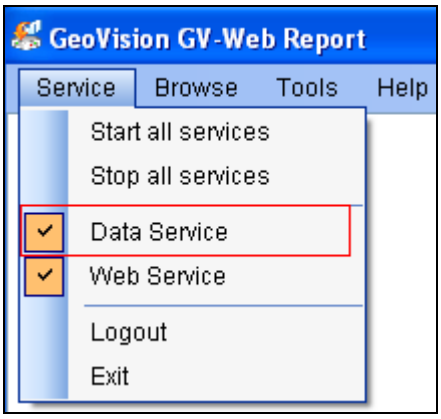


Figure 7-2

4. Select Web Service (Figure 7-2) to enable the Web interface of GV-Web Report.
5. Go to the Web interface of GV-Web Report. You can start accessing the live view and face counting and recognition results from the GV-Smart Box.

7.2 Connecting to GV-System

The integration enables the GV-System to overlay the people counting results received from the GV-Smart Box on the live images. To connect to the GV-System, follow the steps below:

1. To configure the GV-Smart Box to connect to the GV-System, select **Video and Motion** and select **GV-Smart Box Settings**. See *4.1.2 GV-Smart Box Settings*.
2. To add the live view images from the GV-Smart Box, go to the main system of GV-System, select **Configure**, select **General Setting**, select **Camera/Audio Install** and select **IP Camera Install**. This dialog box appears.

Figure 7-3

3. Click **Configure**. This dialog box appears.

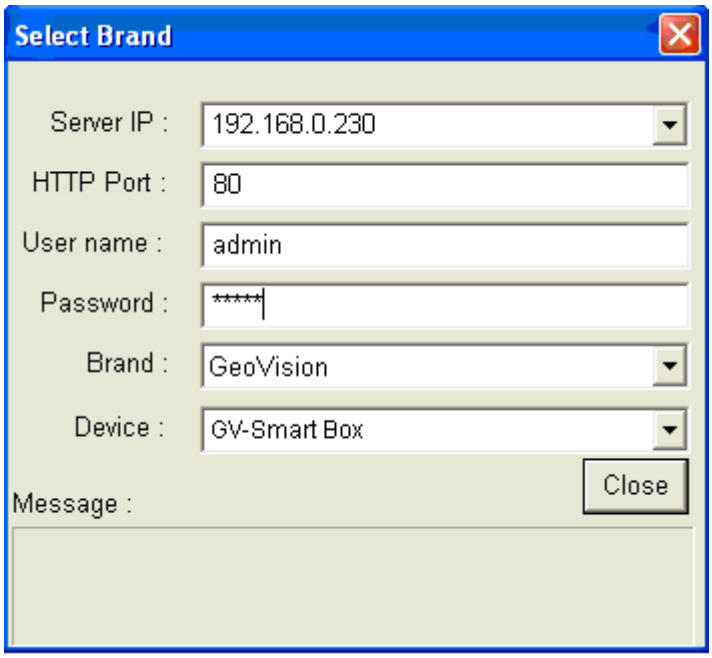


Figure 7-4

4. Type the Server IP, HTTP Port, User name and Password of the GV-Smart Box. Select **GeoVision** from the Brand and **GV-Smart Box** from the Device. This dialog box appears.

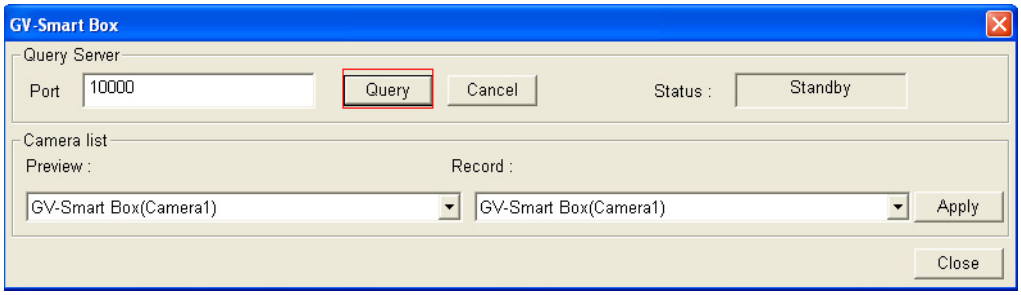


Figure 7-5

5. Click **Query**. After the GV-Smart Box is found, click **Apply**. This dialog box appears.

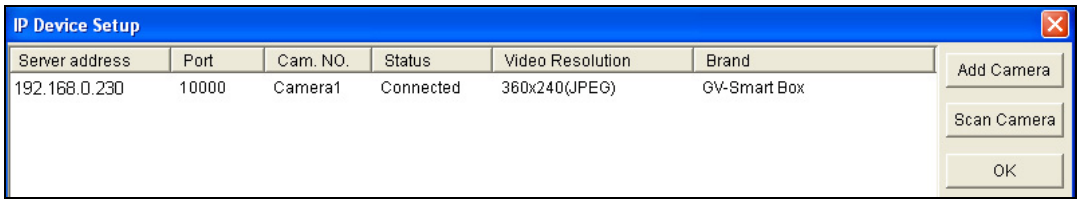


Figure 7-6

6. Right-click the GV-Smart Box to select a display channel.
7. To overlay the people counting results on the live images from the GV-Smart Box, go to the main system of GV-System, select **Configure**, select **Accessories**, select **POS Application Setting**, select **POS Device Setup** and click the **New** tab. This dialog box appears.

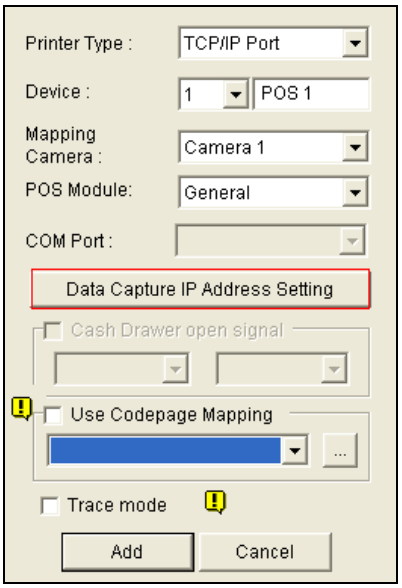


Figure 7-7

8. Select **TCP/IP Port** from the **Printer Type**, select a POS device to display people counting results, select the same camera number you selected in step 6 to map live images and counting results together from the GV-Smart Box, select **General** from the **POS Module** and click **Data Capture IP Address Setting**. This dialog box appears.

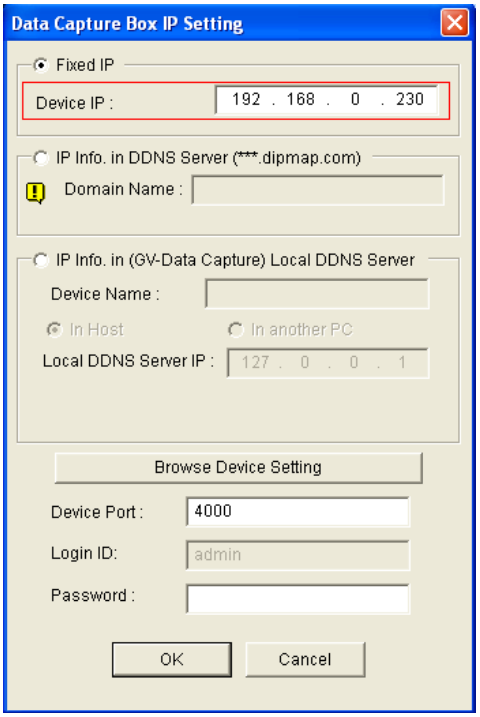


Figure 7-8

9. Type the IP address of the GV-Smart Box. The default value of **Device Port** is 4000. Click **OK**. The people counting results are now displayed on the specified camera channel.

10. To view the people counting results displayed on the POS Live View window, go to the main system of the GV-System, select **View Log** and select **POS Live View**.

Main system POS Live View

Figure 7-9

7.3 Connecting to GV-Compact DVR

The integration enables the GV-Compact DVR to overlay the people counting results from the GV-Smart Box on the live images of GV-Compact DVR. To connect to the GV-Compact DVR, follow the steps below:

Note: You can not access live images from the GV-Smart Box in the integration with the GV-Compact DVR.

---

1. Enable GV-Compact DVR Settings on the Web interface of GV-Smart box (Figure 4-6).
2. Open the OSD menu of the GV-Compact DVR, select **ADVANCED**, select **DISPLAY SETTINGS**, select **INFO DISPLAY SETTING** and select **GV-SMART BOX INFO**. This dialog box appears.

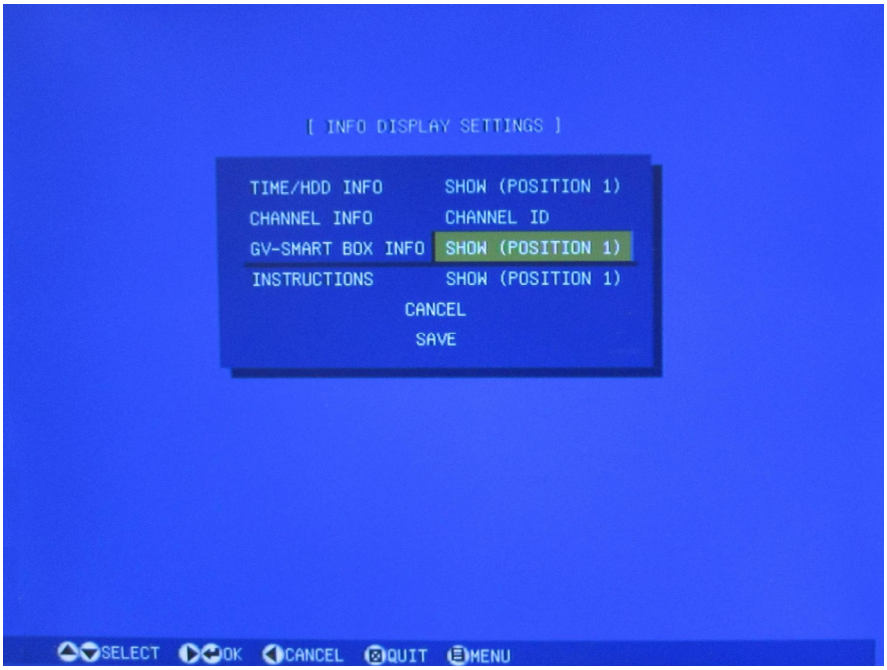


Figure 7-10

3. Select a position for the recognition results to appear on the live view. **POSITION 1** refers to the area below the camera name. **POSITION 2** refers to the top of the live image. **POSITION 3** refers to the area above camera name. **HIDE** refers to hiding the text on the live image.

Specifications

Video Compression		JPEG
Video Resolution		CIF
Frame Rate	**NTSC**	5
	PAL	5
Connectors	**BNC**	2 ports (1 video-in and 1 TV-out)
	Digital I/O	2 sensor inputs and 2 alarm outputs
	Ethernet	RJ-45, 10 / 100 Mbps
	USB	1 port for UMTS only
	Power	DC 12V, 1A, 50~60 Hz
Operation Temperature		-20°C ~ 60°C / -4°F ~ 140°F
Dimensions (L x W x H)		123 x 106 x 25 mm / 4.84 x 4.17 x 0.98 in
Weight		0.345 kg / 0.76 lbs

Appendix

Supported Mobile Broadband Device

Vendor	Model
HUAWEI	E169, E220, E1692, E1750 USB Modem (HSDPA/UMTS/EDGE/GPRS/GSM)
Verizon	U727, U760 USB Modem (EVDO)
Novatel	MC950D (HSDPA/UMTS/EDGE/GPRS/GSM)